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Archives of Dermatology and Syphilology

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THE DERMATOLOGIC ASPECTS OF RAT-BITE FEVER

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The dermatologic aspect of rat-bite fever apparently has been given little attention in the current literature of dermatology. Although the condition is not common, and a small proportion of the patients may not present cutaneous manifestations, the value of the cutaneous lesions as an aid to diagnosis is, in the majority of cases, about as great as in pellagra or early syphilis. It has been considered worth while, therefore, to discuss the literature briefly, and to report the findings in two cases observed in the Mayo Clinic since October, 1916: one of undoubted rat-bite fever, and one in which the diagnosis is presumptive.

Rat-bite fever was probably first reported by the French in 1884.[1] It was not, however, until 1899 that Miyake [2] reported it more in detail. In 1910, Horder [3] mentioned the first cases noted in the literature of Great Britain, and since that time about 140 cases have been reported. The disease has been recognized in all parts of the world, but is more common in countries in which rats are numerous, and in which the natives live in close proximity to animals of the rat family. Japan, England, France and the United States have reported the largest number of cases.

The cause of the disease cannot yet be regarded as fully determined. In 1915, Futaki [4] and his associates described *Spirochaeta morsus-muris* as the cause. This organism has never been identified in man in this country. It has been recovered in Japan from rats, and from patients

1. Millot-Carpentier: Considérations médico-physiologiques sur un cas de morsure de rat suivie d'intoxication ayant determiné des accidents nerveaux simulant l'hydrophobie et l'apparition d'un purpura à forme intermittente, Union méd. **38**:1069-1074, 1884.

2. Miyake, H.: Ueber die Rattenbisskrankheit, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **5**:231-262, 1899.

3. Horder, T. J.: Rat-bite Fever, Quart. J. Med. **3**:121-125, 1909-1910.

4. Futaki, K.; Takaki, F.; Taniguchi, T., and Osumi, S.: The Cause of Rat-Bite Fever, J. Exper. Med. **23**:249-250, 1916.

suffering from rat-bite fever, by several Japanese workers since 1915.[5] More recently, Tileston,[6] of New Haven, demonstrated a streptothrix similar to that described by Schottmüller[7] and Blake.[8] A sporozoon[9] and a diplococcus[10] have also been described by various workers as being of etiologic import.

Spirochaeta morsus-muris, according to the authors who consider it to be the underlying cause, is found in the blood during the first few weeks of the infection. It appears in the capsules of the lymph glands, on the mucous membranes, in the salivary glands and in the parenchymatous organs. For a detailed description of *Spirochaeta morsus-muris* and its localizations in man,[11] the reader is referred to the work of Futaki, Kusama and others.

It would seem that the experimental work on the isolation of the causative organism is not as yet complete.

INOCULATION AND INCUBATION

The organism is said to be inoculated by the bite of the rat, mole, cat, dog or ferret. It is probably transmitted by the saliva at the time of the bite. In the dog and cat the disease is probably acquired by the bite of an infected rat. Following the inoculation of the organism, the wound usually heals readily, and a variable incubation period is followed in succession by the prodromes, the constitutional symptoms

5. Ido, Y.; Ito, H.; Wani, H., and Okudo, K.: Circulating Immunity Principles in Rat-Bite Fever, J. Exper. Med. **26**:377-385, 1917. Ishiwara, K.; Ohtawara, T., and Tamura, K.: Experimental Rat-Bite Fever, Jour. Exper. Med. **25**:45-64, 1917. Kaneko, R., and Okuda, K.: A Contribution to the Etiology and Pathology of Rat-Bite Fever, J. Exper. Med. **26**:363-375, 1917. Kitagawa, J., and Muskoyama, T.: The Etiologic Agent of Rat Bite Disease, Arch. Int. Med. **20**:317-328 (Sept.) 1917. Kusama, S.; Kobayashi, R., and Kasai, K.: The Rat-Bite Fever Spirochete, With Comparative Study of Human, Wild Rat and Field Vole Strains, J. Infect. Dis. **24**:366-375, 1919.

6. Tileston, W.: The Etiology and Treatment of Rat-Bite Fever, J. A. M. A. **66**:995-998 (1916).

7. Schottmüller, H.: Zur Aetiologie und Klinik der Bisskrankheit (Ratten-, Katzen-, Eichhornchen-Bisskrankheiten), Dermat. Wchnschr., Ergnzngshft. **58**: 77-103, 1914.

8. Blake, F. G.: The Etiology of Rat-Bite Fever, J. Exper. Med. **23**:39-60, 1916.

9. Ogata, M.: Die Aetiologie der Rattenbisskrankheit, Deutsch. med. Wchnschr. **34**:1099-1102, 1908; Mitt. a. d. med. Fakult. d. k. Univ. z. Tokyo **8**: 287, 1909; **9**:343, 1911.

10. Douglas, S. R.; Colebrook, L., and Fleming, A.: A Case of Rat-Bite Fever, Lancet **1**:253-255, 1918.

11. Footnotes 4 and 5.

and the exanthem of the disease, with the characteristic temperature curve and a prolonged course, if the infection is untreated. The incubation period usually varies from twelve to thirty days, although it may be of much shorter duration, or as long as two months. The prodromal symptoms include evidence of infection at the site of the bite, with swelling, pain and local heat. The local edema may extend for a considerable distance from the point of entry of the organism. The red streaks of lymphangitis and discrete adenitis with tenderness are among the local manifestations. The buboes do not suppurate, nor does the infected area contain pus when it is incised, although it may give the impression of fluctuation. The site of the bite may ulcerate or may suggest the appearance of a primary syphilitic lesion, or it may remain healed throughout the entire course of the disease.

SYMPTOMS

The constitutional symptoms are ushered in from twelve to thirty days after the inoculation by a chill, followed by a rise in temperature that may reach 105 F. The symptoms are those of a general infection, headache, backache, malaise, muscle and leg pains, and so forth. In the more severe types reported by Japanese observers, involvement of the nervous system is not uncommon. Paresthesias, neuralgic pains and motor disturbances of the extremities may arise as complications. The kidneys may show evidence of irritation and the gastro-intestinal tract react as in any severe toxemia. Burton-Fanning [12] reports the presence of epididymitis as an early complication.

The temperature curve is one of the distinctive features of the disease. It is of an intemittent type with exacerbations occurring from every two to six days, most of the pyrexial peaks appearing on the sixth day. The sudden rise in temperature is preceded by a chill or chilly sensation, and the drop in the temperataure curve usually follows within a few hours. As the untreated disease progresses, the intervals between the exacerbations become longer and the temperature lower. Decline of the fever by lysis may occur. With each chill and fever there is a flareup in the constitutional and cutaneous symptoms of the disease which gradually subside as the temperature falls, only to return with the next rise in temperature. In the severe type, the fever may run a continuous course. A detailed description of the constitutional symptoms of the disease is given by Arkin.[13]

12. Burton-Fanning, F. W.: Five Cases of Rat-Bite Fever. Two Cases Treated Successfully by Novarsenobillon, Brit. M. J. **1**:886-889, 1921.

13. Arkin, A.: Rat Bite Fever, Arch. Int. Med. **25**:94-111 (Jan.) 1920.

THE EXANTHEMS

The exanthematic phase of rat-bite fever may be graded as mild or severe, and classified under the individual groups of roseola, indurated erythematous plaques, urticarial manifestations,[14] lesions of the mucous membranes and alopecia.

Burton-Fanning estimates that in two thirds of all cases of rat-bite fever an exanthem is present. The distribution is general, lesions appearing on the face, extremities and trunk. The roseola consists of large reddish blue or purple macules scattered diffusely over the lower extremities, neck and face, contrasting in distribution with a syphilitic roseola, for example, which is more apparent on the trunk. There may, however, be a slight diffuse mottling on the trunk. The macular lesions usually appear with the first attack of fever and rapidly involute, leaving brown pigmented patches that may remain for several weeks, but which do not usually persist throughout the course of the disease.

The most typical cutaneous lesion of rat-bite fever is the indurated bluish red or livid plaque, varying in diameter up to 12 or 14 cm., with a lighter colored concentric zone just within the margin, or a pale center. These lesions are usually not symmetrically distributed, but have been found on both extremities and on both sides of the face at the same time. They are widely disseminated and variable in size. The larger plaques are, as a rule, definitely indurated and may be surrounded by smaller nonindurated macules. With each exacerbation of fever, the older or fading lesions light up and new lesions may appear, gradually subsiding in their turn with the fall in the temperature. Residual pigmented patches develop and persist for from five to ten days. The erythematous borders of new lesions may become confluent, or even overlap the involuting patches, but the indurated portions of the lesions tend to remain discrete. Moderate tenderness may be noted in the indurated plaques, but the macules do not cause discomfort. Edema of the affected skin is sometimes a prominent feature, and its extent is dependent on the location of the indurated lesions. Edema of the eyelids resulting from lesions on the face, and edema of the extremities when indurated plaques occur on them, may be quite marked. Desquamation follows the involution of erythematous plaques and takes the form of a coarse flaking.

The lesions of the skin tend to become less numerous and prominent as the disease progresses, and they disappear altogether with the spontaneous resolution of the infection or its arrest by treatment. Arkin has described a rash on the mucous membranes of the mouth. No lesions in this location were noted in either of my cases.

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14. Symes, J. O.: A Case of Rat-Bite Fever, Brit. M. J. **1**:1017, 1923.

Patches of alopecia on the scalp were an interesting feature of my second case. There were large, irregular, partially bald areas, with a general thinning of the hair, which persisted until treatment arrested the process. The hair grew again rapidly when the child started to improve.

The Wassermann reaction has been reported positive by Briggs,[15] who cites two other cases. The reaction became negative immediately following treatment with neo-arsphenamin in Briggs' case.

REPORT OF CASES

CASE 1.—A girl, aged 4, a resident of Iowa, while playing in a barn, was bitten on the hand by a rat on Sept. 4, 1917. Hydrogen peroxid was applied by the parents. A slight swelling of the hand lasted for twenty-four hours. The wound healed readily, and for two weeks the child was perfectly well; a swelling then appeared at the site of the bite, and within twenty-four hours a superficial lymphatic involvement developed. The local inflammation on the hand and the lymphadenitis became steadily worse, and were accompanied by extending edema. The mother said that the child had had a slight fever, but chills were not noted during this period. The child was up and about, and did not complain of severe pain in the hand or arm. The family physician was consulted two weeks after the onset of symptoms, and immediately incised the swelling on the back of the hand, but did not obtain pus. The child then began to show evidence of systemic infection; she had chills and a very high fever. With the exacerbations of fever the child was fretful. She was nauseated and vomited. Local applications of ointments and hot wet dressings failed to relieve the inflammatory reaction.

On October 2, the patient was admitted to the Mayo Clinic. Local measures, such as hot dressings, with elevation of the hand and arm, were continued, but without relief. On October 3, the mother noticed the first patches of erythema on the cheeks. The lesions were pale pink and superficial. They disappeared the following day, only to reappear with the next chill and exacerbation of fever, which occurred October 7. Chills and fever recurred on the twelfth, eighteenth, and twenty-third, the temperature rising to 103 F. and returning to normal within twenty-four hours. Lesions on the extremities were observed for the first time on October 23, seven weeks after the bite. Dr. Stokes was then called in consultation, and he made a diagnosis of rat-bite fever. The patient was at once placed on arsphenamin treatment, and given two injections of 1 decigram each, with an interval of five days between injections. Following this, no further exacerbations of temperature were noted, and the cutaneous lesions and the local process in the hand and arm rapidly involuted. No systemic complications occurred during the course of the infection. The urine was normal and the blood picture practically negative, except for slight secondary anemia. There was no leukocytosis and no disturbance of the normal relation of the cellular elements. A blood Wassermann reaction was negative. Cultures were made from excised tissue and grown on glucose agar, yielding, however, only *Staphylococcus albus*. Darkfield examinations of the blood, urine, and sputum and of serum taken from two of the patches, failed to reveal spiro-

15. Briggs, N.: Treatment of Rat-Bite Fever with Novarsenobillon, Brit. M. J. **1**:185, 1922.

chetes, as did Levaditi stains from tissue excised from a fresh plaque (Figs. 1, 2 and 3).

The pathologic process is apparently that of a simple acute inflammatory lesion of the skin, with edema, vascular dilatation, and moderate lymphocytic perivascular infiltration, especially marked around the hair follicles and sweat coils. In certain cases this was so marked as almost to obliterate the involved sweat coil. No distinctive cellular elements or special pathologic changes of diagnostic value were noted.

Fig. 1 (Case 1).—General distribution.

Comment.—In this case, a definite history of the bite of a rat, followed by the distinctive succession of prodromes, constitutional symptoms and cutaneous lesions, with a characteristic temperature curve and a prompt and complete therapeutic response to arsphenamin, established the diagnosis in spite of our inability to find *Spirochacta morsus-muris.*

It will be recalled that only Japanese observers have thus far been successful in isolating this organism in cases of rat-bite fever in man.

Case 2 presents greater difficulty in diagnosis because no history of rat bite could be elicited, and because the course of the disease was interrupted by tonsillectomy, which might conceivably have been responsible for the cure of the patient. It was, moreover, impossible to isolate

Fig. 2 (Case 1).—Site of bite.

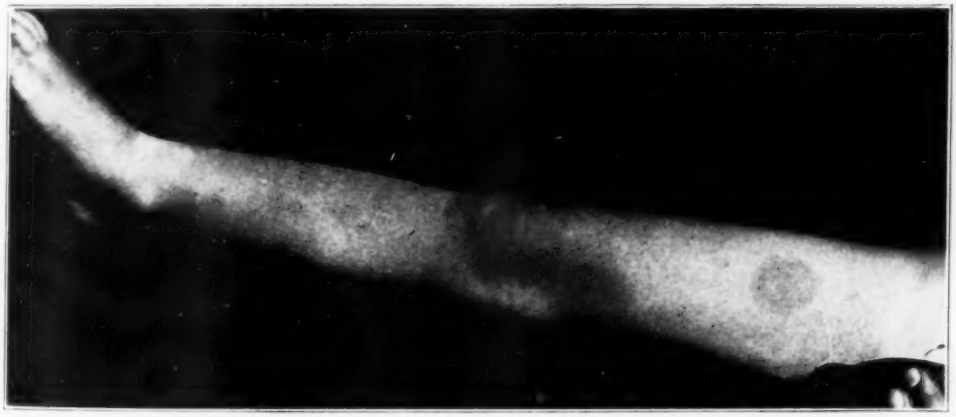

Fig. 3 (Case 1).—Plaques about the knee and upper middle of thigh.

any organism in spite of more elaborate attempts than were possible in the previous case. Careful study of the characteristics and course of the patient's lesions, of the temperature curve, and of the relation of her improvement to the intravenous injections of neo-arsphenamin, seem to me to make the diagnosis of rat-bite fever strongly presumptive. As the course of the disease and character of the lesions practically summarize all that has been reported as to the cutaneous symptoms of

rat-bite fever, I believe it is justifiable to report this case as probable rat-bite fever, but illustrative of the differential diagnostic problems that may be encountered.

Case 2.—A girl, aged 5, a resident of North Dakota, was first taken sick about the middle of December, 1921, with a swelling of the left leg below the groin and knee, adenitis in both groins, and a vaginal discharge. The swelling below the knee and the vaginal discharge disappeared in less than a week, but the adenitis persisted. From seven to ten days later swelling reappeared below the knee, and an indurated plaque developed until it became almost 7.5 cm. in diameter. A diagnosis of erysipelas was made, and local applications were employed. During the next six weeks the plaque appeared to involute, but new patches of erythema appeared on the right arm, then on the right leg

Fig. 4 (Case 2).—Alopecia.

and left arm, and smaller patches on the left leg. These patches or plaques persisted for only a few days, and were followed by new lesions at the site of the old ones, and also in new locations.

As nearly as the mother could remember, lesions appeared on the face about a month after the plaques on the extremities. The child had had a very high fever on several occasions, although no record was kept until she was seen by a physician in St. Paul, who had her under observation for five weeks. The alopecia shown in Figures 5, 6 and 7 appeared four weeks before the child entered the Clinic, and approximately two and one-half months after the onset of her illness.

No definite history of rat bite or any other bite could be obtained from the mother. She even denied that there were rats in their vicinity, but on further inquiry it was found that the child played a great deal in a storehouse behind a store in which there were many rats. The child was very fond of the family cats and frequently played with them, so that the possibility of infection from this source must not be overlooked. Nothing suggesting a history of acute rheumatism could be elicited, either before or during the present illness. During the month preceding the patient's entry into the Clinic, progress had been steadily unfavorable in spite of the continued administration of sodium salicylate. On the legs and arms were several indurated plaques, symmetrically

distributed. There was diffuse edema of both legs, more marked of the right. Erythema extended a considerable distance beyond the individual indurations. Neither tenderness nor fluctuation could be elicited in any of the lesions. The mucous membranes were not involved. Examination of the heart and lungs was negative. The urine was normal. The blood revealed: moderate secondary anemia, 50 per cent. of hemoglobin, 3,410,000 erythrocytes, 8,200 leukocytes on

Fig. 5 (Case 2).—Plaques, edema and mottling of lower extremities.

the first count and 5,200 on the second. The Wassermann reaction on the blood was negative. The cutaneous Pirquet tuberculin test was also negative. A nasal smear was negative for acid-fast bacilli, and the blood culture was negative. Roentgenograms of the chest and tibiae were negative. Neurologic examination was attempted, but no cooperation could be obtained from the patient. The examination of scales and hair from the scalp failed to disclose any trichophytic organisms. The palpable lymph nodes of the indurated areas

were aspirated, and cultures made on dextrose brain broth and ascites fluid were negative. The aspirated lymph was examined by the dark field, with negative results. Dark-field examinations of the blood, urine and saliva were also negative. Inoculations of white mice and rats subcutaneously, intraperitoneally, and intravenously with the blood, urine, sputum and aspirated lymph from the buboes were also negative when examined at intervals of one week and one month after inoculation.

Before the special laboratory work was undertaken, the patient was seen by a dermatologic consultant who suggested differential possibilities as follows: (1) erythema nodosum and erythema multiforme, (2) rat-bite fever, (3) drug eruption, (4) leukemia, (5) scorbutic changes and (6) lepra. By elimination these possibilities were reduced to erythema nodosum and erythema multiforme,

Fig. 6 (Case 2).—Mottling of left thigh.

and a possible rat-bite fever. In view of the failure to obtain a history of a bite and the uncertainties as to the previous course of the temperature, it was advised that the salicylate treatment be continued and tonsillectomy performed. Meanwhile, the special laboratory studies described were carried out. The operator who removed the tonsils reported that they were small and apparently not the site of any gross pathologic change. At the time of tonsillectomy, cultures were made from the excised tonsils and the culture material injected into rabbits according to the technic of Rosenow. At necropsy the third day after the injection, areas of hemorrhage in the subcutaneous tissue were noted. On the seventh day after the tonsillectomy there had been no change in the child's condition. The lesions were slightly less livid, but the mother had observed similar changes from time to time previous to the operation. On the eighth day after tonsillectomy the patient was given 1 decigram of neoarsphenamin intravenously, without immediate reaction, and without increase in

the fever. Two days later a second dose of 1 decigram of neo-arsphenamin was given. The child was then taken home; she had begun to show decided improvement. A month later the mother wrote that the skin was practically normal, and that the child appeared to be perfectly well.

Discussion.—The differential argument applicable to this second case is as follows:

Although no history of actual rat bite could be obtained, the child was known to have played frequently in a place where there were many rats, and also to have played with cats from whom indirect infection from bites could easily have been possible.

The prolonged course of the infection is more suggestive of rat-bite fever than of erythema nodosum. The usual course of rat-bite fever, untreated, is six months, and this case had been of four months' duration when the patient was brought to the Clinic.

A fairly definite history of four to seven-day exacerbation of fever reaching 105 F. was elicited. The mother was definite in her statements, and she had also observed that the lesions underwent a flareup with each peak of high temperature. Periodicity of this sort is rare in erythema nodosum, especially over so long a period.

The complete absence of arthritic symptoms and endocarditis in so extreme a grade of erythema nodosum seems rather to exclude a tonsillar streptococcic infection as the cause.

The morphology of the cutaneous manifestations of the eruption does not conform to the conventional erythema nodosum or erythema multiforme, and does conform, in practically every detail, to published accounts of the lesions of rat-bite fever. This is particularly true of the striking alopecia of the scalp.

The practical absence of important gross lesions in the tonsils and adenoids, as noted at the time of removal, seems to be out of keeping with the possibility of the streptococcal origin of this infection. No other foci could be identified.

No exacerbation or flareup followed the removal of the tonsils and adenoids, as would have been expected had they been the source of such a severe and acute infection.

It has been the experience at the Clinic that neo-arsphenamin has a beneficial influence on erythema nodosum and erythema multiforme, but it is unusual to see it respond so promptly to so small a dose and so few injections. It must be considered, however, that the previous tonsillectomy destroyed much of the value of the therapeutic test.

Salicylates administered for a long period and in rather large doses had no influence on the course of the disease, which is not in keeping with the possibility of tonsillar streptococcal origin.

Failure to isolate *Spirochaeta morsus-muris* does not necessarily invalidate the diagnosis of rat-bite fever.

SUMMARY

Two cases are reported, one of undoubted rat-bite fever in a child cured by two intravenous injections of arsphenamin, and one probable case of rat-bite fever in which tonsillectomy reduced the value of the therapeutic test without proving the condition to be streptococcal in origin.

Rat-bite fever in general is identified by the history of a bite by a rat, cat or dog, with a primary incubation period of from ten to thirty days before the appearance of local reaction at the site of the bite; by constitutional prodromes and symptoms of a general infection with a two to seven-day intermittent fever; by the fairly characteristic erythematous indurated plaques in the skin which undergo exacerbation with each rise of temperature and subside between times; by the prolonged course (six months) in untreated cases; by the prompt response to the intravenous administration of arsphenamin or neo-arsphenamin; and by the finding of *Spirochaeta morsus-muris*. It should be added that the last mentioned criterion is not essential to diagnosis, as observers outside of Japan have been unsuccessful in isolating the organism.

The differential diagnosis of the local reaction may include pyogenic cellulitis, giant chancre and erysipelas, and on the basis of the constitutional symptoms, malaria, relapsing fever and trench fever. The possibility of the acute leprous exanthem must not be overlooked.

The treatment of rat-bite fever, as suggested by Hata,[16] consists of the intravenous injection of one of the arsphenamins, given in doses proportional to body weight. It may be necessary to give four or five injections of the drug at five-day intervals, and also to give one or two injections after the temperature has completely subsided, to prevent relapse. Following the first injection of arsphenamin, a Herxheimer-like flareup of the temperature with transitory accentuation of the lesions is the rule.

16. Hata, S.: Salvarsan therapie der Rattenbisskrankheit in Japan, München med. Wchnschr. **59**:854-857, 1912.

PEMPHIGUS VULGARIS

WITH FINDINGS IN THE SPINAL CORD SUGGESTING THE ETIOLOGY OF THE SKIN LESIONS: REPORT OF A CASE

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Pemphigus is a disease of sufficient rarity to permit the detailed description of a case from the clinical standpoint alone, in the hope that something of value may have been observed which will help to clarify its etiology or therapy. This and the finding of some extremely interesting histopathology in the spinal cord are my reasons for making the following report.

CASE REPORT

History.—Mrs. H. A. L., aged 53, when first seen on June 22, 1920, was a widow. The cause of her husband's death was not ascertained. Five children were living and well. She had passed the menopause without trouble. Her right eye had been removed surgically during girlhood, because of injury.

In September, 1919, a dentist had extracted one carious tooth and treated a rather severe pyorrhea. Soon after the tooth was extracted, lesions appeared in the mouth, which were considered "canker" sores. The condition in the mouth continuously became worse, and in November, 1919, a bullous eruption appeared on the abdomen, then rapidly spread over nearly the whole body. In addition to the bullae, certain areas seemed to desquamate without the formation of bullae. The lesions covered the abdomen, back, buttocks, thighs, legs, arms, forearms and neck (Figs. 1 and 2). None appeared on the scalp or perineum. She was in the hospital many weeks and had periods of improvement and relapse a number of times. There had been some fever nearly constantly, but it was never high.

For the past two weeks she had been unable to eat, chiefly because of nausea and vomiting, had lost weight rapidly and was in a stuporous condition.

Physical Examination (June 22, 1920).—Her temperature was 99 F. The pulse was regular, not rapid. The patient lay in a stupor from which she could not be aroused. There was a distinct acetone odor on the breath. The right eye had been removed. The general physical examination revealed nothing of importance as far as the heart, lungs and abdominal organs were concerned. The reflexes were negative. There was marked emaciation.

There was only one bulla present—a small, flaccid example on the dorsal surface of the right middle finger. About it there was a relatively wide red areola. Its contents were turbid. Over the body in the areas enumerated above were a multitude of scars with a deep brown pigmentation gradually fading out toward the periphery. Some of these areas were 3 or 4 inches (7.62 cm. or 10.16 cm.) in diameter. In the center of some of the pigmented areas there was a soft irregular scar. At this time there remained two small ulcers on the back, one over each great trochanter and one in each axillary space.

In the mouth there was a white film over the gums and hard palate with a number of shallow ulcerations. The tongue was scarlet red, much of the

Fig. 1.—Front view of author's patient showing the distribution and character of the lesions. This was taken at the height of her first attack when the lesions seemed to lose the bullous type and assume the foliaceous.

Fig. 2.—Character and distribution of lesions on the back. Note the symmetry of the lesions in Figures 1 and 2.

epidermis was exfoliated and it was very sensitive. The lips also showed exfoliation of the epidermis.

At that time the laboratory findings were as follows: Urine: specific gravity, 1.021, acid, albumin trace, acetone +, diacetic acid +, pus ++, and an occasional hyalin cast. Blood: red blood cells, 4,034,000; hemoglobin, 55; white blood cells, 9,600; polymorphonuclears, 53 per cent.; large lymphocytes, 24 per cent.; small lymphocytes, 20 per cent.; eosinophils, 3 per cent. The Wassermann test was negative. Cultures taken from a bleb showed staphylococcus only.

Treatment and Course.—The situation seemed to demand treatment of the patient's general condition rather than of the disease. Continuous rectal irrigation with Fischer's solution and 5 per cent. glucose was employed, and milk and cream, 1 ounce (30 c.c.) of each, by mouth was given every hour. She began to improve at once.

July 10, 1920: The blood count was: red blood cells, 3,584,000; hemoglobin, 45.

July 15, 1920: A blood culture made by the aerobic method was negative.

Aug. 3, 1920: The findings were: red blood cells, 2,880,000; hemoglobin, 40; white blood cells, 7,000; polymorphonuclears, 51 per cent.; large lymphocytes, 6 per cent.; small lymphocytes, 41 per cent.; eosinophils, 2 per cent.

Because of the increasing anemia, on Aug. 9, 1920, 50 c.c. citrated blood were given from a Group II donor by syringe (the patient being Group II).

Aug. 21, 1920: 250 c.c. citrated blood were given.

Aug. 24, 1920: The findings were: red blood cells, 2,720,000; hemoglobin, 46.

Sept. 20, 1920: There were 3,152,000 red blood cells.

Oct. 13, 1920: Her mouth was almost healed. She was eating heartily and her bowels were moving regularly. She was sitting up in her chair. The old ulcers were healed. She had had some new blebs covering the dorsal aspect of each finger from the nail to the metacarpophalyngeal joint, but they had healed without difficulty.

Oct. 21, 1920: She had weighed 79 pounds (35.8 kg.) eight days ago and on this date, 80 pounds (36.2 kg.). She had weighed 176 pounds (79.8 kg.) when in health.

She continued to improve, and on Jan. 26, 1921, she weighed 111 pounds (50.3 kg.). There were no blebs. The color was good. She was up and about.

She continued in fair health, and on Nov. 24, 1921, this notation was made concerning her condition: "In July, 1921, she had most of her infected teeth removed. Soon afterward blisters appeared on the tongue. Most of the mucous membrane of the tongue and cheeks exfoliated within about two weeks. Occasionally a small typical bleb would form. Soon the blebs and exfoliation involved the vermilion border of the lips. About three weeks after the extraction of the teeth a small bulla appeared on the abdomen below the navel. This was followed by numerous other small blebs. At first they healed quickly. They were typical bullae of pemphigus, were filled with clear serum which soon became cloudy, and were surrounded by no or a very narrow zone of redness. As the lesions healed in the center they tended to spread outward by exfoliation of the superficial layers of the epidermis, without bleb formation, thus forming a circinate shallow ulcer. The whole lower half of the abdomen from the symphysis to the navel became involved. During this time lesions began to appear on both the lower extremities, particularly about the ankles and knees. These went through the same stages as those on the abdomen. When the abdomen was about healed and the lesions on the legs and upper thighs were at their worst, lesions began in each axilla, then about both elbows, then on the back, where the whole surface was involved at one time or another. At

present all lesions are healing. There is a little tendency for periodic, mild, quickly healing lesions to occur in the sites of old ones."

Treatment up to Nov. 24, 1921.—Silver and various cleansing washes were used in the mouth. At first nothing was applied to the skin, and the lesions were left exposed to the air. Then ointment of ammoniated mercury was tried with dressings. Later ointment of zinc oxid was substituted for the mercury and seemed to do as well as anything, merely acting as a protection. It was found that, in the recurring lesions, painting with 1 per cent. crystal violet solution in 50 per cent. alcohol seemed to stop their progress and permit more rapid healing. Finally when the lesions were extensive and were weeping profusely with consequent loss of serum and discomfort to the patient, a tent was constructed, and on every second day the body was exposed to light and heat from ordinary incandescent bulbs under this tent for about two hours at a time. This caused drying of the lesions, formation of scabs and delimitation and more rapid healing, besides doing away with much odor and discomfort from the moisture. (Later she developed a marked dislike for this type of treatment and despite the fact that she improved under the influence of the lights she could not be induced to continue them).

For about two weeks at the beginning of this attack quinin salicylate, 20 grains (1.3 gm.) a day by mouth was given, together with sodium cacodylate 3 grains (0.19 gm.) intramuscularly or intravenously, every second day. Then the quinin salicylate was discontinued, but the sodium cacodylate was continued for about one hundred and ten days, with a total of approximately 165 grains (10.73 gm.). Sufficient sodium bicarbonate was given continuously to just keep the urine alkaline to methyl red. Dilute hydrochloric acid, pepsin and pancreatin were given daily, based on experience during her first attack, which seemed to show a quicker response in blood forming and the care of her food when these substances were administered.

Her appetite and digestion were good throughout this attack, and no acidosis developed as happened in her first attack. Her loss of weight was much less than formerly, and she was able to sit up a little almost daily. At the height of this attack a little nervous depression almost amounting to a melancholic state developed, but this also was less marked than during the former attack. Anemia was moderate but did not require the measures resorted to formerly.

Sept. 12, 1921: The blood count was: red blood cells, 3,944,000; hemoglobin, 82 per cent.; white blood cells, 10,200; polymorphonuclears, 35 per cent.; large lymphocytes, 11 per cent.; small lymphocytes, 49 per cent.; eosinophils, 5 per cent.

A blood culture, taken on Sept. 27, 1921, by the aerobic method showed no growth.

Oct. 25, 1921: Urine: specific gravity, 1,026; slightly acid; albumin, a faint trace. There were a moderate number of white blood cells and a few granular casts.

This patient continued in about the same state throughout the winter of 1921 and 1922. In December, 1921, the blood count was red blood cells, 3,504,000; hemoglobin, 60 per cent.; white blood cells, 8,300; polymorphonuclears, 49 per cent.; large lymphocytes, 8 per cent.; small lymphocytes, 40 per cent.; eosinophils, 2 per cent.; basophils, 1 per cent.

In July, about a year after the onset of this attack, she began to lose ground more rapidly. The lesions came out in increasing numbers until they covered her body. She was confined to bed and lay in a most foul smelling mass of dressings, even though all the care that could be exercised in her home with limited means, was used. Several times before she became entirely unable to

get up, she fainted when she was being helped up, and later even the exertion of getting the dressings changed would sometimes be sufficient to cause syncope. Near the end she was in a state of stupor, and although she could be aroused, it was with difficulty, and her answers were slow and showed a great narrowing of her mental field, although she was rational. For a day or so before her death there was irrationality, and for twenty-four hours, coma. Death occurred on Sept. 18, 1922, almost exactly three years after the first evidence of the disease.

NOTABLE POINTS OF THE HISTORY

The course of this disease in this patient was chronic, and certain features of it suggest a chronic, low grade infection. The most prominent of these features is the fact that both her main attacks began immediately following work on the teeth. The first time this work consisted of some extractions, scaling and cleaning of the remaining teeth, and treatment of pyorrhea, and the second time, extraction of the remaining teeth. There was also at times a low grade fever and a moderate leukocytosis, as well as a marked anemia of the secondary type. These findings may, of course, be accounted for on secondary infection in the bullae and ulcerations. It is notable that cultures from the blebs showed only the usual staphylococcus.

Blood culture was made twice by the usual aerobic method, and remained sterile. It is to be regretted that this line of investigation was not more persistently carried out, since Frederick Eberson [1] of the Mayo Clinic has recently reported such interesting findings in blood cultures taken from seven patients suffering from pemphigus.

One of the striking points noted in this case, and casually mentioned in the reports of many other cases (for example all the cases described in detail by Eberson) is the distribution of the lesions. In the first place, there was a notable symmetry of the lesions. My opportunity to study this point was during the second attack, which I was able to follow throughout. The lesions first appeared in the mouth. They next appeared on the abdomen, below the navel and on both sides alike. When these began to heal, lesions appeared on both lower extremities, particularly about the knees and ankles, but also on the anterior surface of the thighs and even out to the toes. When these were improving both axillae became involved, then the area about both elbows, then both sides of the back, at first in the upper third but later spreading downward until the whole back became involved, at one time or another, and always symmetrically as to the right and left sides, although the lesions were not always of the same extent on the two sides. The symmetrical areas involved seemed to conform

1. Eberson, Frederick: Studies on the Etiology of Pemphigus. I. Bacteriologic Findings in a Group of Cases of Pemphigus, Arch. Dermat. & Syph. **8**: 204 (Aug.) 1923.

fairly accurately to areas of skin supplied by a given pair of nerves or group of pairs arising in close proximity in the cord. The first lesions on the abdomen were in the area of the tenth, eleventh and twelfth dorsals. These were followed by lesions in the domain of the lumbars throughout; these in turn by lesions in the area of the first, second, third and fourth dorsals, then the third, fourth, fifth and sixth cervicals, and so on. One felt that the areas of skin supplied by distinct nerves or groups of nerves could almost be marked out.

These observations led me to conclude that at necropsy, lesions should be found in the dorsal side of the cord, the dorsal roots or in the ganglions. At one time permission was asked and granted to make a spinal puncture, but the patient was in such poor condition that it was delayed until too late. In view of the findings reported below, it might have been negative. The lesions in the skin, it seemed to me, resembled trophic disturbances due to lesions in the sensory nerves, rather than a primary disease of the skin. The course of the disease itself suggests a general disease rather than one of the skin. It was therefore with heightened interest that necropsy was made, with permission to remove the cord.

The diagnosis of phemphigus in this case was verified by Drs. J. M. Mayhew, H. J. Lehnhoff, J. J. Snipes, E. J. Angle and others of Lincoln, Nebraska, by Dr. H. C. Sumney of Omaha, Nebraska, and at the University Hospital of the University of Nebraska School of Medicine in Omaha.

PROTOCOL OF POSTMORTEM EXAMINATION

Mrs. H. A. L., aged 55, died on Sept. 18, 1922, 7:20 a. m. Necropsy was performed on September 18 at 1:30 p. m. The body was that of a woman, 161 cm. in length. It was extremely emaciated. There was moderate edema of the feet and lower legs. The globe of the right eye was missing. The lower portion of the cornea of the left eye was opaque and dry. The pupil was 6 mm. in diameter. About both eyes, extending down over the face, about the nostrils, mouth and chin, the face was covered by a greenish scab. This was easily removed, leaving a superficial ulceration extending only through the epidermis. Over the whole of the neck and upper part of the anterior surface of the chest there was loss of the epidermis, leaving a moist, denuded surface very much like that occurring in a second degree burn when the bleb has been opened. Over the entire body except the abdomen and the lower portion of the anterior surface of the chest, there were numerous ulcerations of the type described. Some of these were of greater depth so that they oozed blood and had become covered with dark hard scabs. These were particularly numerous over the back of the trunk.

The peritoneum was smooth and glossy. The appendix was retrocecal, small, white and apparently not the seat of chronic inflammation. The mesenteric lymph nodes felt relatively large, but this may have been due to marked loss of weight. There was no increase in fluid in the abdominal cavity. The diaphragm reached to the fifth interspace on the right and the sixth rib on the left.

The left pleural cavity contained about 300 cm. of cloudy, brownish fluid with flakes of fibrin floating in it. There were two firm bands of adhesion between

the pleura of the lung and the chest wall at the apex. The right contained no excess of fluid, adhesions or other pathologic condition.

The pericardial cavity contained about 20 cm. of blood tinged fluid. It was otherwise normal.

The heart weighed 225 gm. The foramen ovale was slightly patent, but the opening was closed by a flap. The wall of the right ventricle was very thin. That of the left was less than 1 cm. in thickness. It was soft, flabby and brown. The ventricles, endocardium and pericardium were apparently normal. Most of the aorta was normal.

The upper lobe of the left lung was of normal appearance and crepitated throughout. It had been torn where the bands of adhesions were broken up. On the cut surface there was no abnormality except a little induration beneath the point of attachment of these bands of adhesion. The lower lobe was heavy, firmer than normal and dark red. Near the lower border there was an area about 10 cm. in diameter that was extremely dark; it was firm and did not crepitate. The surface of this area was covered by flakes of fibrin, and beneath the pleura there were a number of hemorrhagic areas. Just above the lower border of the lung in this area there was a yellow patch about 1 cm. in diameter. The cut surface of this lobe was deep red, and large quantities of frothy fluid exuded from it. Beneath the solid area mentioned above there was a cone shaped portion of the lung base to the pleura that was of the same consistency, color and appearance as the pleural surface. In its center there was an area about 2 cm. in diameter that was soft and had an extremely foul odor. The right lung was normal throughout. The peribronchial lymph nodes were normal in size, black and not otherwise abnormal.

There were adhesions between the gallbladder and the duodenum, and the omentum was adherent to the right side of the mesentery. Otherwise it was negative.

The liver weighed 1,625 gm. It was soft and yellowish brown. The cut surface was of a similar color. The centers of the lobules were large and pale red, while the borders were narrow and yellow. The gallbladder was large and thin walled, but not otherwise abnormal.

The spleen was small; it weighed 125 gm. It showed deep fetal lobulations.

The parenchyma protruded on section, but it was otherwise not abnormal.

The pancreas was small, pale and firm.

The left suprarenal was of normal size. There was a small cyst on the upper pole. The medullary portion was relatively small. The right was normal in size and appearance.

The left kidney weighed 150 gm. The capsule stripped readily leaving a finely granular surface. The cut surface was pale, particularly that of the cortex. The cortex was thin and distinctly demarcated. It was yellowish. The parenchyma bulged slightly from the cut surface. The right kidney weighed 125 gm. The surface tore when the capsule was stripped. It was otherwise similar to the left.

The ovaries were small, hard, firm and white. The tubes were normal. The fundus of the uterus was not large but was composed largely of three intramural fibroid tumors from 2 to 3 cm. in diameter. Over one of these the peritoneum was red and injected. The bladder was negative.

Examination of the aorta was negative.

The head was not examined.

The external surface of the dura mater of the spinal cord was smooth and showed no abnormalities. When the dura was punctured, cerebrospinal fluid

poured out as if under pressure. There were no adhesions between the dura and pia. The vessels of the spinal cord did not seem to be unduly injected. At the level of about the tenth dorsal vertebra on the dorsal surface of the cord there were three small bodies in the pia mater. The smallest was about 1 mm. and the largest about 3 or 4 mm. in diameter. They were white, opaque and seemed rather firm. (On closer examination of the cord, ten or twelve of these bodies were found scattered throughout its length.)

Anatomic Diagnosis.—This was: pemphigus; pulmonary infarction with abscess formation; serofibrinous pleurisy with effusion; brown atrophy of the heart muscle; chronic adhesive peritonitis; fatty degeneration of the liver; cloudy swelling of the spleen and kidneys; chronic interstitial nephritis and multifibroids of the uterus.

Probable cause of death: Pemphigus and infarction of the lung with lung abscess.

DETAILED STUDY OF SPINAL CORD

Certain tumor-like lesions have already been mentioned in the protocol of the postmortem examination as occurring in the cord. There were in all about ten or twelve of these. They were gray to white in color and varied in size up to 3 mm. They were irregularly circular in outline and tended to be spherical when small. As they grew they tended to become flattened, so that they lay with one flat surface against the dorsal root. They were attached to the dorsal root either close to its origin or along its course as it ran downward and before it left the proximity of the cord to make the loop and join the ventral root. There was apparently no symmetry in the distribution of these tumors; they were seen scattered throughout the dorsal and lumbar regions.

On study of sections taken from various regions of the cord, from the upper dorsal to the very tip, there was one finding that at once drew attention. Scattered throughout the length of the cord were multitudes of peculiar bodies which are fully described below. These bodies were found grouped chiefly about the exit of the dorsal horn, in or just beneath the pia mater (Figs. 3 and 4). They were seen in fair numbers in the horn itself (Figs. 6, 10 and 11) even as far toward the commissure as Clark's column in the dorsal region, and in the white matter immediately adjacent to the horn, more on the medial side in the column of Goll. They were also seen in the pia mater about the ventral side of the cord, but in very small numbers compared to the dorsal, and never within the cord on this side, nor in the ventral roots or horns. Outside the cord they were seen in large numbers in the sheath of the dorsal root (Fig. 8) and occasionally in the dorsal root itself for a short distance from the origin. They were not observed as far as the dorsal root ganglion.

Within the cord and in the pia mater covering the cord, these bodies appeared to be spherical in outline, homogeneous in structure, taking a purplish blue stain in the sections stained with hematoxylin and eosin. They varied from 7.6 microns to 23.9 microns in size, with an average of about 14 microns. They had a definite limiting membrane and nothing could be observed in any of them resembling a nucleus. In the sheath of the dorsal root they seemed to become somewhat larger, although there were also small ones, and began to be surrounded by concentric layers of connective tissue (Figs. 9, 15 and 16). All stages could be found; i. e., the number of layers of connective tissue about them apparently depended on their age. In the center, or near the center of the tumors described above, one of these bodies could be found as illustrated (Fig. 12), and the tumor mass consisted of more or less concentric layers of connective

Fig. 3.—Exit of dorsal horn in the dorsal region. Note the darkly stained bodies scattered in and about the horn, especially as it emerges from the cord.

Fig. 4.—Exit of dorsal horn in the sacral region. Note the same dark stained bodies grouped in this region.

Figure 5

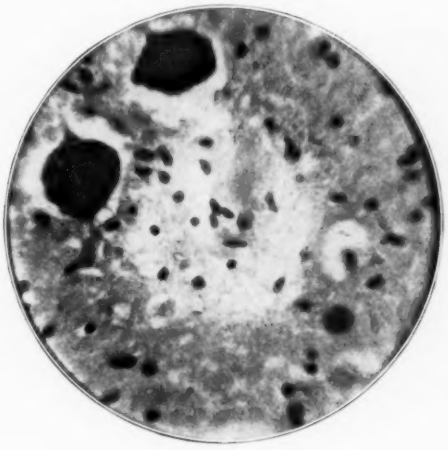

Figure 6

Fig. 5.—A group of dark stained bodies at the exit of the dorsal horn in the dorsal region of the cord. High power magnification.

Fig. 6.—Photomicrograph under oil immersion showing one of the dark stained bodies lying in the dorsal horn adjacent to Clark's column, the cells of which are seen at one border of the field.

Figure 7

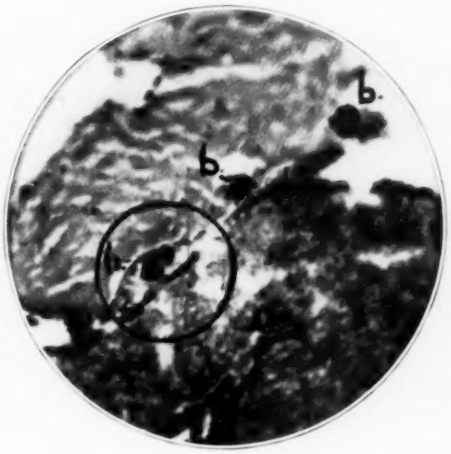

Figure 8

Fig. 7.—Low power photomicrograph showing the dark stained bodies grouped in the region of the exit of the dorsal horn of the cord.

Fig. 8.—Photomicrograph showing a group of four of the dark stained bodies lying in the sheath of the dorsal root, in the dorsal region of the cord: *a*, dorsal root; *b*, bodies. Within the circle the bodies measure 28.5 and 19.8 microns.

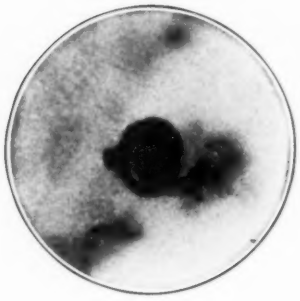

Figure 9

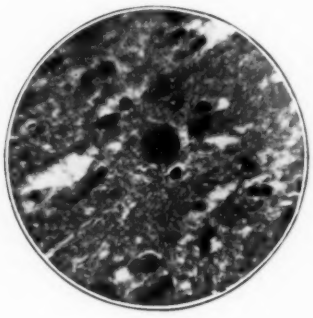

Figure 10

Fig. 9.—Photomicrograph under oil immersion of the largest "body" shown in Figure 8. The central dark area is 22.8 microns in diameter, and the whole mass is 34.2 by 41.8 microns.

Fig. 10.—One of the "bodies" imbedded in the dorsal horn. Taken under oil immersion. Diameter 23.9 microns.

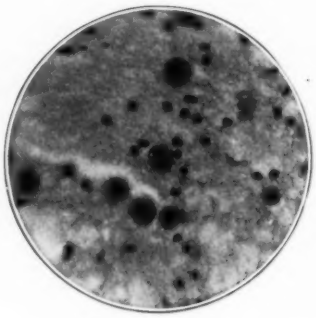

Figure 11

Figure 12

Fig. 11.—One of the groups of these "bodies" shown in Figure 3 within the circle. Taken under oil immersion.

Fig. 12.—One of the tumors described, attached to the dorsal root. Size of tumor, 411 by 1,185 microns. Note the small dark spot near one extremity of the tumor. This is one of the "bodies" described in Figures 13 and 14.

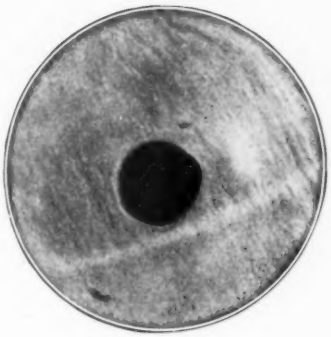

Figure 13

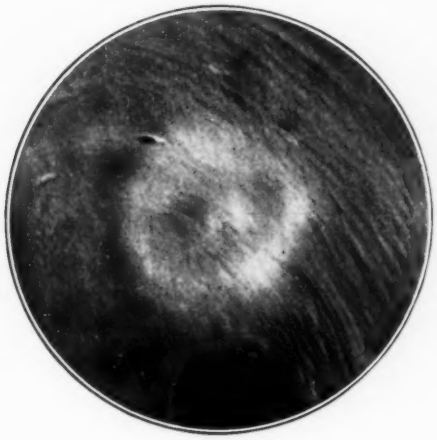

Figure 14

Fig. 13.—Photomicrograph of the "body" in the central portion of the tumor shown in Figure 12. Size, 41.8 microns.

Fig. 14.—Photomicrograph of the same body taken to show the arrangement of the concentric layers about it. Note the paucity of this tissue in nucleii.

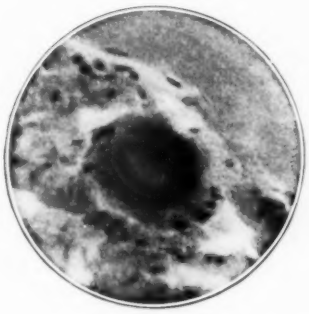

Figure 15

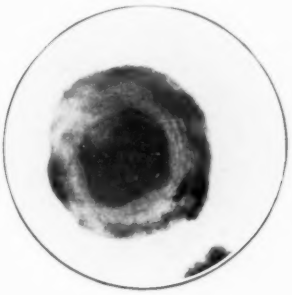

Figure 16

Fig. 15.—Photomicrograph of another of these bodies in the sheath of the dorsal root. The central body is 38 microns and the mass is 49.4 microns in diameter. This is evidently the beginning of a tumor such as is shown in Figure 12.

Fig. 16.—Another early tumor in the sheath of the dorsal horn. The central body is 38 microns and the mass is 83.6 microns in size. In both Figures 15 and 16, note the concentric arrangement of the connective tissue and the greater number of nucleii in the outer layers.

tissue laid down about this body as a starting point. This connective tissue (Figs. 13 and 14) was very dense and had but a few nuclei, except in the very outer layers, which were plentifully supplied with nuclei, as may be seen in all stages of the tumor growth. This gives evidence that the size of each of these tumors was gradually increasing by the laying down of new layers about the outside, more or less concentrically around the "body" as a center.

A certain amount of degeneration was found in the cells of the dorsal root ganglion (Fig. 17). Some of them were shrunken, had poorly staining nuclei, and were being invaded by neurophagocytes. A few cells in Clark's column seemed to be degenerating. Sections were stained by a silver impregnation method, and study was made in various areas of the cord for tract degenerations, but none could be found.

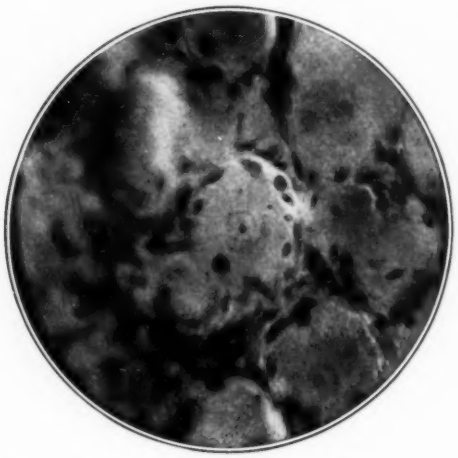

Fig. 17.—Ganglion cells in the dorsal root ganglion, showing some degeneration and neurophagocytosis.

The origin of these bodies in the cord, in and about the dorsal horns and in and about the dorsal roots, was obscure. They bore some resemblance to the concretions seen in psammomas, but whether or not they were identical with them, I have not been able to determine.

COMMENT

We have here, however, a disease resembling a chronic infection but with skin lesions drawing attention to the spinal cord, the dorsal roots or the dorsal root ganglions as a possible point of attack, with the lesions in the skin a manifestation of trophic disturbance as a result of injury to the sensory nerve supply. We have, further, a definite gross and microscopic pathologic condition in the suspected areas, which it is easily conceivable might cause sufficient injury to the sensory nerves to result in such trophic disturbances. Whether the bodies described in the cord and dorsal roots, which could be followed through various stages to the formation of definite macroscopic fibrous tumors attached

to the dorsal roots, were primarily neoplasms or were the direct result of chronic irritation in the form possibly of a chronic low grade infection cannot be definitely answered without further observation in other cases.

In Eberson's [1] description of work on the bacteriology of pemphigus he seems to have isolated an organism from the blood of each of seven patients with pemphigus which was consistently of a certain type. With this organism he has been able to produce in guinea-pigs and rabbits some manifestations in the skin that bear a resemblance to pemphigus. The organism was pathologic for all the animals and could be recovered from their blood and organs after death. An interesting observation in these animals was clinical evidence in a number of them of definite injury to the nervous system. The author has failed to state whether microscopic lesions were observed in the cord, dorsal roots or ganglions, but intimates that a further report along the line of histopathology may be forthcoming. Of course, in animals whose disease lasts but a few days to a few weeks at the outside, lesions comparable to those in a case of three years' standing could not be expected, but definite lesions in the areas named might establish the mode of formation and progress of the lesions here described.

References to careful histopathologic studies of the spinal cord in cases of pemphigus are not plentiful in the literature. Many of the descriptions of the pathology in this disease have dealt chiefly with findings in the skin or in the more accessible organs. In an article by Poirrier,[2] the following facts are mentioned:

1. Examination of sections of the cord shows that the lesions are principally in the gray substance of the posterior horns and in the periependymal region.

2. In 1880, Jarisch described a grave lesion in the posterior horns of the spinal cord in a patient who died of pemphigus foliaceous.

3. In 1881, Ferrero examined sections of the cervical, dorsal and lumbar cord and found that the cells of the posterior horns were atrophied, chiefly in the dorsal region, to such a degree that the nucleus and the cellular protoplasm were invisible. On the other hand, the cells of the ventral horns were normal.

4. Westberg (1895) reports that in sections of the cervical cord examined by him, there was decreased staining of the columns of Goll and of the zone of the posterior roots and a paler staining than normal of the anterior horns. Sections of the dorsal cord stained normally.

5. Bocchieri (1898) found medullary lesions in the gray substance, fragmentation of the cells, extravasation of the red cells and leukocytic

2. Poirrier, L.: Pathogenie nerveus des pemphigus chronique, Paris Thesis, 1904.

infiltration with predominance of these lesions in the posterior horns, the anterior commissure and the peripendymal region.

That lesions occur in the cord, chiefly in the dorsal side, seems therefore to be fairly definitely established in preceding literature. It is not inconceivable that the lesions described in this paper are a later or further developed stage of the findings mentioned by the authors quoted in Poirrier's article.

SUMMARY

A case of undoubted chronic pemphigus is presented for study. Certain symptoms and findings in the case suggest a chronic low grade infection. Other observations seem to point to possible lesions in the spinal cord, the dorsal roots or their ganglions as the seat of trouble, the skin lesions being merely a manifestation of trophic disturbance in this tissue as a result of the nerve lesions. Definite gross and microscopic lesions are readily demonstrable in the predicted areas at postmortem examination.

CONCLUSIONS

1. Pemphigus has been classified as a skin disease.

2. The etiology has not been determined with certainty, although Eberson's recent work seems to point to *Bacillus pemphigi* as a possible cause.

3. The pathology of the disease is meagerly described, the descriptions being largely limited to that of the skin, with a few reports on the internal organs.

4. The case herein described presents findings in the spinal cord and dorsal roots that probably have not been described before.

5. These lesions are in such a location and of such character that their possible rôle in the production of the visible lesions of this disease is perfectly evident.

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A COMPARATIVE STUDY OF THE HISTOLOGIC CHANGES PRODUCED EXPERIMENTALLY IN THE LIVER AND KIDNEYS OF THE RAT BY ARSPHENAMIN AND NEO-ARSPHENAMIN *

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Following the studies of Pearce and Brown [1] on the pathologic changes induced in the kidneys and suprarenal glands of experimental animals by various arsenical compounds, we published detailed reports of our studies on the histopathologic changes produced in various organs of rats and rabbits by the intravenous injection of solutions of arsphenamin, neo-arsphenamin and mercury.[2]

The most pronounced changes were observed after the intravenous injection of large amounts of both compounds; multiple injections of amounts comparable to doses administered to human beings according to body weight produced only slight changes of minor importance. But amounts commonly injected intravenously in conducting the required standard toxicity tests in rats, namely, 0.1 gm. of arsphenamin in alkaline solution and 0.2 gm. of neo-arsphenamin in water per kilogram of body weight, produced profound pathologic changes, particularly in the liver, kidneys and suprarenal glands. These doses were of course from 10.6 to 15.5 times larger than doses commonly administered to human beings at one time, corresponding to 7 gm. of arsphenamin and 14 gm. of neo-arsphenamin per 70 kilograms, or approximately 140 pounds of body weight, but they have shown which organs are most liable to injury, the nature of the injury and cellular changes and the importance of studies of this kind in chemotherapeutic investigations in addition to the usual toxicity tests for determining the immediately lethal or maximum tolerated doses for experimental animals.

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1. Pearce, L., and Brown, W. H.: Histological Changes in Arsenic Kidneys, Jour. Exper. Med. **22**:525-534, 1915; On the Pathological Action of Arsenicals on the Adrenals, Ibid. **22**:535-543, 1915.

2. Kolmer, J. A., and Lucke, B.: A Study of the Histologic Changes Produced Experimentally in Rabbits by Arsphenamin, Arch. Dermat. & Syph. **3**: 483 (April) 1921; A Study of the Histologic Changes Produced Experimentally in Rabbits by Neo-Arsphenamin, Ibid., p. 515; A Study of the Histologic Changes Produced Experimentally in Rabbits by Mercurial Compounds, Ibid., p. 531.

In our studies on the histopathologic changes produced by single large intravenous injections of alkaline (disodium) solutions of arsphenamin, rats were injected with 0.1 gm. per kilogram of body weight, corresponding approximately to 0.0031 gm. of arsenic per 100 grams. Neo-arsphenamin was injected intravenously in doses of 0.2 gm. per kilogram of body weight, corresponding approximately to 0.0038 gm. of arsenic per 100 grams. In terms of arsenic, therefore, both series received closely similar amounts.

The livers of rats receiving the arsphenamin injections showed "extensive and striking changes in all animals; these changes were mainly in the form of extensive areas of coagulation necrosis involving all parts of the lobule, but particularly the central and middle portions. Rats succumbing within two days after the injection have shown changes so extensive as to resemble those commonly found in acute yellow atrophy, etc." After the injection of neo-arsphenamin, however, the liver changes were much less pronounced even though the animals had received a slightly larger amount of arsenic.

> Among the animals succumbing within a day or two of injection, marked congestion of the intralobular veins, and the presence of numerous thrombi composed of conglutinated and partly hyalinized erythrocytes constituted the most conspicuous lesions. Associated with this hyperemia was a slight degree of cloudy swelling of the liver cells, particularly in the central lobular areas. Many of the cells in these regions possessed a coarsely granular or irregularly vacuolated protoplasm, while little nuclear changes were seen. Among animals surviving for five days or longer, congestion and small thrombi were likewise found, but a more prominent change embraced numerous small areas of necrosis irregularly distributed in the lobules, and apparently not occurring in any constant lobular zone.

In other words, we found that arsphenamin produced a greater degree of injury to the liver than neo-arsphenamin.

On the other hand, neo-arsphenamin produced greater injury to the kidneys than arsphenamin, but in our reports we failed to give these differences proper attention because of "marked variations in the severity and extent of the lesions" in different animals and because "the degenerative alterations were of all degrees." The attention of one of us (J. A. K.) was first called to the greater nephrotoxic effects of neo-arsphenamin by Dr. G. C. Lake of the Hygienic Laboratory during the course of one of his visits to our laboratory. Dr. Lake had noticed that the kidneys of rats succumbing after intravenous injections of neo-arsphenamin prepared by several different laboratories presented a "chocolate" appearance denoting cloudy swelling and severer parenchymatous changes in contradistinction to the normal or approximately normal appearance of the kidneys of rats succumbing after injections of alkaline solutions of arsphenamin. One of us immediately gave this matter detailed attention and soon found that Dr. Lake was correct:

a further investigation of the comparative nephrotoxic and hepatotoxic effects of neo-arsphenamin and arsphenamin was then undertaken, and the results are briefly summarized in this communication.

In the meantime, however, and a month after the publication of our papers, Hooper, Kolls and Wright [3] published a paper showing that neo-arsphenamin produced 50 per cent. more injury to the kidneys of rats than arsphenamin, when the effects were evaluated in terms of amounts of arsenic injected. Para-oxy-m-amino-phenyl-arsenoxid, commonly designated as "arsenoxide," and regarded by Ehrlich as primarily

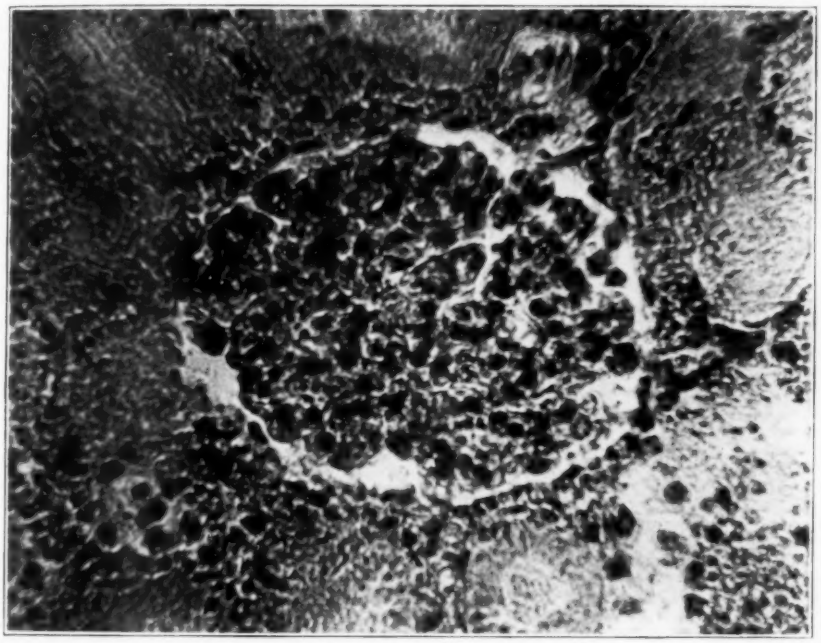

Fig. 1.—Kidney of a rat that lived one day after receiving neo-arsphenamin. The glomerular coils are packed with conglutinated and partly disorganized erythrocytes; the vascular endothelium is prominent. There is well marked necrosis of the epithelium of the convoluted tubules. (High dry power enlargement.)

responsible for the toxic effects of arsphenamin, was found five times more toxic to rat kidney than arsphenamin and seven and one-half times more toxic than neo-arsphenamin.

In the present investigation we adopted the plan of Hooper, Kolls and Wright of evaluating the results according to the total amounts of

3. Hooper, C. W.; Kolls, A. C., and Wright, D.: Quantitative Pathological Studies with Arsenic Compounds, Hygienic Lab. Bull. No. 128, 1 (May) 1921.

arsenic injected; that is, a comparison of the toxic effects of arsphenamin and neo-arsphenamin was made on the basis of the actual amounts of arsenic injected in both compounds per body weight rather than on the basis of the amounts of arsphenamin and neo-arsphenamin injected per body weight. On this basis we have again found that arsphenamin produces greater injury to the liver than neo-arsphenamin but that neo-arsphenamin produces greater injury to the kidneys, in confirmation of the observations of Lake and of Hooper, Kolls and Wright.

METHODS EMPLOYED

All tests were conducted with white rats varying in weight from 100 to 150 gm. and kept on a diet of boiled wheat, boiled corn, bread and occasionally fresh vegetables, for a period of at least 10 days preceding the tests. Each rat was weighed and injected about 18 hours after the last meal. Arsphenamin prepared by different laboratories [4] was

Results of Administration of Arsphenamin and Neo-Arsphenamin in Three Series of Animals

Arsphenamin Series			Neo-arsphenamin Series			
Total Number of Rats	Arsenic per 100 Grams of Body Weight	Survival, Days	Total Number of Rats	Arsenic per 100 Grams of Body Weight	Survival, Days	Series
18	0.003 - 0.0039	1 - 4	2	0.0036 - 0.0039	3 - 10	A
22	0.004 - 0.0059	1 - 4	16	0.0043 - 0.0057	1 - 6	B
3	0.0062 - 0.0074	1 - 2	25	0.0061 - 0.0083	1 - 6	C

made up in a 2 per cent. alkaline solution according to the method employed in the routine toxicity tests and administered intravenously in doses of 0.1 gm. per kilogram of body weight at the rate of 1 c.c. in two minutes. Neo-arsphenamin prepared by different laboratories was prepared in 4 per cent. solutions in distilled water and administered intravenously at the same rate in doses of 0.2 gm. per kilogram of body weight.

Each compound was analyzed for its arsenic content, and the total amount of arsenic administered calculated for each animal.

Necropsies were performed on all animals as soon after death as possible. The liver and kidneys were fixed in solution of formaldehyd U. S. P., embedded in paraffin and sections stained with hematoxylon and eosin; in addition, the von Kossa method for the demonstration of calcium was employed.

For purposes of comparative study and analysis the animals were divided into three groups according to the amount of arsenic administered (Table 1). Series A comprised eighteen rats injected with

4. No differences were apparent in the histologic changes produced by arsphenamin and neo-arsphenamin prepared by three different manufacturers.

from 0.003 to 0.0039 gm. of arsenic per 100 grams of weight in the form of arsphenamin, and two rats were injected with 0.0036 to 0.0039 gm. of arsenic in the form of neo-arsphenamin. Series B comprised twenty-two rats injected with from 0.004 to 0.0059 gm. of arsenic in arsphenamin per 100 grams of weight and 0.0043 to 0.0057 gm. of arsenic in neo-arsphenamin per 100 grams. Series C comprised three rats injected with from 0.0062 to 0.0074 gm. of arsenic in arsphenamin per 100 grams of weight and from 0.0061 to 0.0093 gm. of arsenic in neo-arsphenamin.

HISTOPATHOLOGIC CHANGES PRODUCED IN THE KIDNEYS BY ARSPHENAMIN

Arsenic from 0.003 to 0.0039 gm. per 100 Grams (Survival One Day).—All organs showed vascular and degenerative changes which varied somewhat in degree in the different animals. The fibrous capsule, the stroma and the walls of the larger vessels were normal. The capillaries were usually engorged in the boundary zone and in irregular patches in both cortex and medulla. The glomerular tufts were prevailingly large and engorged, but collapsed coils were often encountered. Their nuclei, and to some extent the vascular lining in general, were frequently prominent, swollen and vesicular; however, in some glomeruli no alteration, or even nuclear shrinkage, could be observed. The capsular spaces occasionally contained a few red blood cells and granular eosin staining precipitate.

Commonly the erythrocytes in the capillaries and the smaller vessels were misshapen, agglutinated, partly fused and in some instances transformed into a hyaline mass, while in the larger blood channels the cells were usually well preserved.

The epithelium of many of the convoluted tubules appeared greatly swollen and degenerated; no particular area was constantly more involved than the rest, the degree of degeneration varying considerably in different portions of the cortex.

The cells in the majority of the tubules of some areas were so swollen as almost, or sometimes entirely, to obliterate the lumena, and to approximate the tubules with compression of the intertubular capillaries. The epithelium was frequently so poorly delineated that the tubules appeared to be lined by a syncytium. The cytoplasm stained a muddy red or took only a faint stain; it was granular, as well as indistinctly vacuolated. Sometimes instead of a granularity the cells presented an almost hyaline appearance. Some of the more degenerated cells stained a faint gray-blue tint.

Many of the cells were anuclear, or their nuclei exhibited different types of retrogression. Of these the most common consisted in shrinkage and condensation; such nuclei stained deeply and uniformly.

Others were ballooned and stained faintly, or the chromatin was sometimes condensed in clumps at the nuclear periphery or collected into several small round masses which took an eosin tint and appeared like coarse hyaline droplets.

The impression was sometimes gained that such degenerated tubules occurred particularly in the neighborhood of glomeruli. The cells of the thick limbs of Henle were affected to a certain extent; they frequently appeared fragmented, and were now and then anuclear and desquamated. The thin limbs of Henle and the large collecting tubules

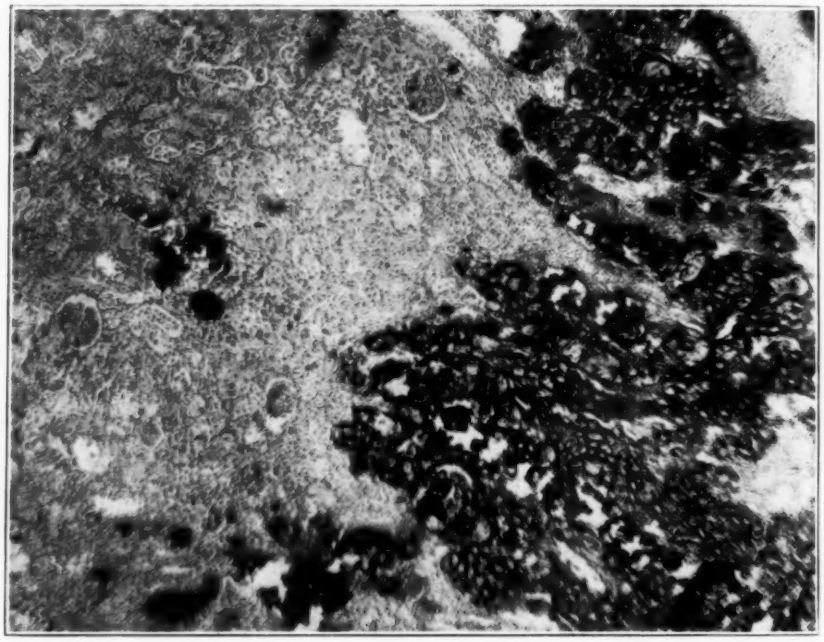

Fig. 2.—Kidney of a rat that lived four days after receiving arsphenamin. Necrosis with calcification involving particularly the deeper parts of the cortex. (Low power enlargement.)

usually possessed well preserved lining. Casts of granular detritus and occasional red cells were found in different portions of the tubular system.

Arsenic from 0.0032 to 0.0037 gm. per 100 Grams (Survival Two Days).—The changes were somewhat more marked than in the preceding group, but individual variation was again noted. The capillaries in the boundary zone were prominent and usually contained more or less fused erythocytes. The glomerular tufts were large; their coils often distended with partly fused erythrocytes. Their nuclei were frequently

small, round and shrunken, and they stained deeply; but swollen, pale-staining nuclei were also encountered. The capsular spaces contained much precipitate in the form of granular masses or eosin-staining globules. The convoluted tubules were much degenerated, but the degree of degeneration varied considerably in different parts of the cortex. With low power magnification, scattered small, pale staining areas could be seen. Here the epithelium was much vacuolated and often anuclear. But in most of the sections the tubular lining took a deep eosin tint; the cytoplasm was lumpy, coarsely granular or in the form of irregular, indefinite, roundish droplets. The cellular outlines

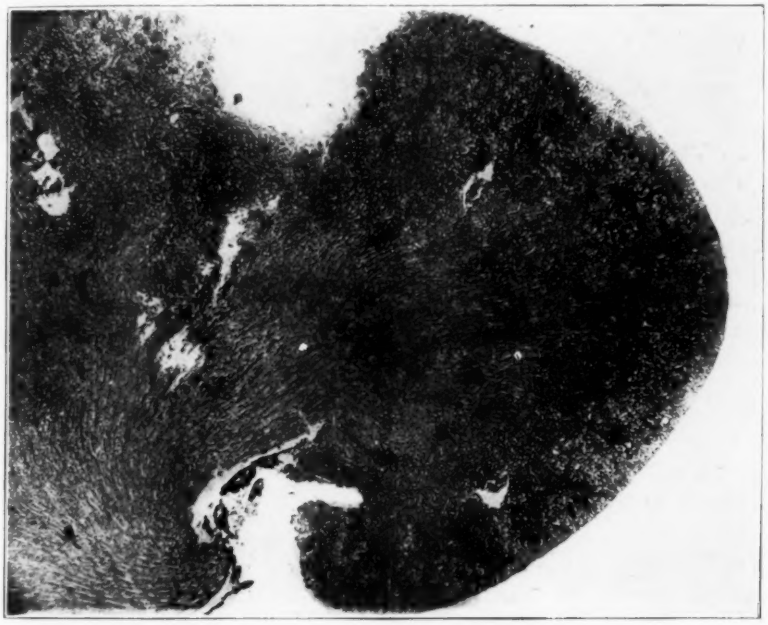

Fig. 3.—Kidney of a rat that lived one day after receiving arsphenamin. There are numerous patches of necrosis (pale in illustration) scattered throughout cortex. (Hand lens enlargement.)

were poorly marked. Nuclear changes consisted chiefly of much shrinkage and deep staining. The tubular lumina were occupied by granular eosin-staining débris. Similar changes were found in the thick limb of Henle; the other straight tubules occasionally presented desquamation of well preserved cells, but generally they showed no alteration.

Arsenic 0.0039 gm. per 100 Grams (Survival Four Days).—There were extreme degeneration and widespread necrosis, somewhat more marked in the inner half of the cortex. The necrotic areas were distinctly

patchy and irregularly distributed, but in some regions they had become confluent. The tubular epithelium was usually swollen, fused, anuclear and hyaline. Frequently the lumina contained hyaline material. Much calcium deposition was present within the necrotic cells. This in places was massive, completely obscuring everything else, but where only small quantities of lime salts were present, they seemed to be most in evidence at the bases of the cells. The capillaries were inconspicuous; many were empty, and there was no swelling of the vascular epithelium. The glomeruli were often collapsed, their nuclei shrunken and dense.

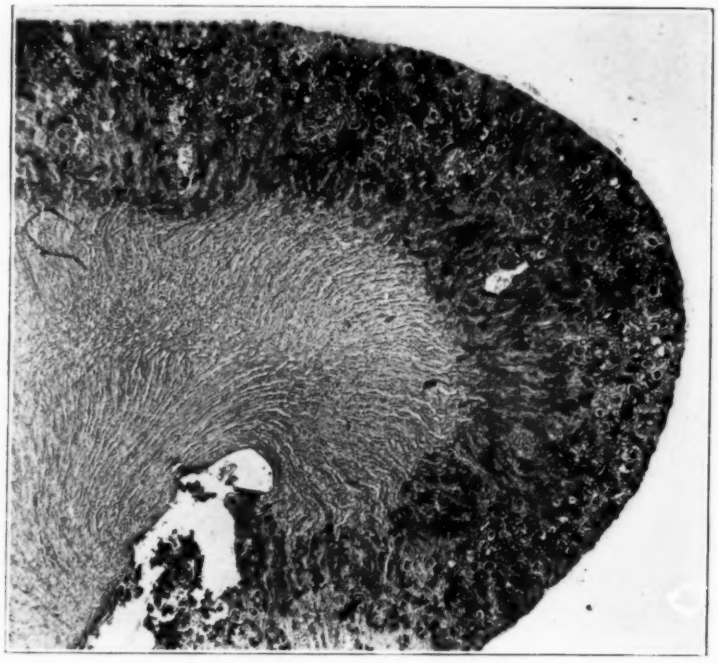

Fig. 4.—Kidney of a rat that lived three days after receiving neoarsphenamin. There are extensive patches of necrosis and calcification throughout the cortex; the medulla is not involved. (Hand lens enlargement; the calcareous material is black in the illustration.)

Frankly necrotic tufts were now and then seen; these were never calcified. The necrosis and calcification did not involve any of the medullary tubules.

Arsenic 0.004 to 0.0058 gm. per 100 Grams (Survival One Day).—There was inconstant, irregularly distributed engorgement of the capillaries, particularly pronounced in the boundary zone. The erythrocytes were often agglutinated and fused. The glomerular coils were generally

distended with partly hyalinized blood cells; endothelium was prominent; many collapsed coils were noted. In a few tufts the nuclei were small and shrunken. There was usually much eosin-staining débris in the capsular spaces. The degenerative changes were especially marked in the inner half of the cortex. The cells of the convoluted tubules were swollen, granular and often vascuolated at their bases; nuclear generation was common. There were nowhere any areas of frank necrosis. The staining varied considerably; the less altered cells took a deep eosin tint; the more degenerated cells were almost colorless.

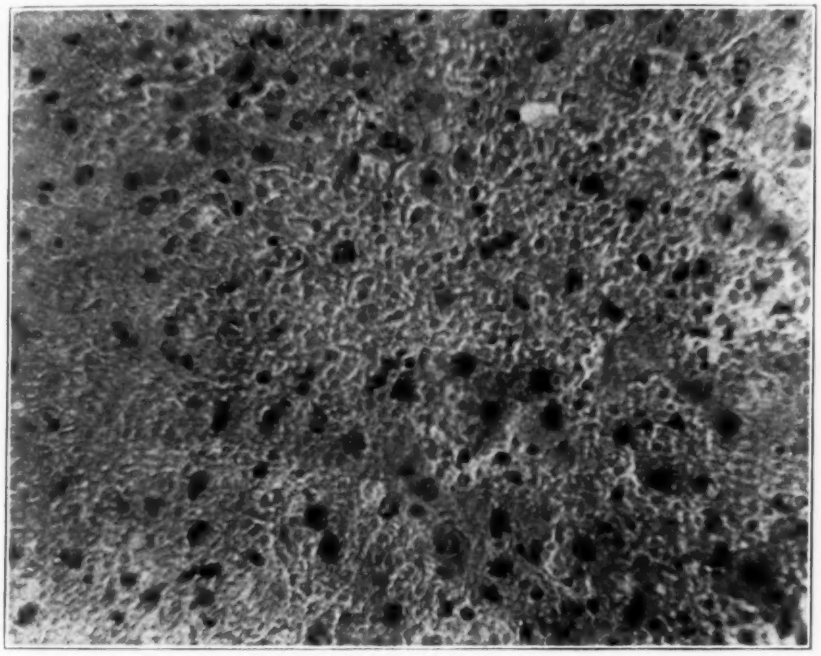

Fig. 5.—Liver of a rat that lived one day after receiving arsphenamin. The tissue is flooded with partly fused erythrocytes (shown as roundish poor staining bodies), the liver cells are compressed, their cytoplasm is often indistinct; the nuclei are swollen with condensation of the chromatin at the nuclear periphery.

Granular detritus was frequently found in the tubular lumina. The thick tubes of Henle were similarly affected, but the thin limbs and the large, collecting tubules were practically normal.

Arsenic from 0.0041 to 0.0052 gm. per 100 Grams (Survival Two Days).—The capillaries were engorged in irregularly distributed areas. There was much agglutination and partial fusion of erythrocytes. Occasional small hemorrhages were found. The glomeruli were fre-

quently small, with shrunken nuclei. Much granular and globular precipitate was present in the capsular spaces. There were irregular areas of tubular degeneration, characterized by cytoplasmic granularity or clumping into hyaline fragments, vacuolization and nuclear changes. They were frequently more marked in the inner portions of the cortex. In only one animal was there any evidence of early frank necrosis.

Arsenic from 0.0043 to 0.0059 gm. per 100 Grams (Survival Four Days).—There were many minute hemorrhages and areas of intense engorgement. The convoluted tubules in irregularly distributed patches

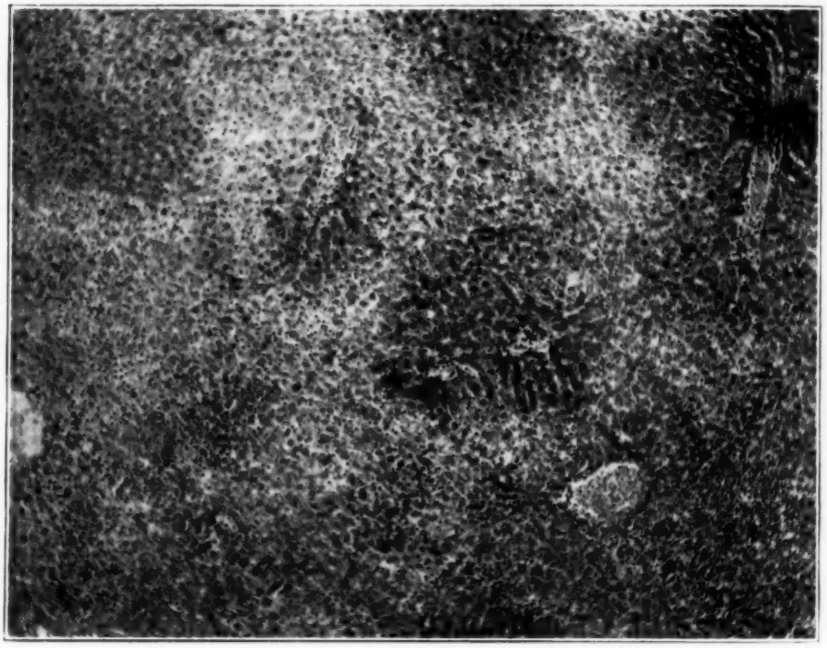

Fig. 6.—Liver of a rat that lived two days after receiving arsphenamin. Extensive necrotic areas (pale in the illustration) generally involving all but the outer parts of the lobules. The dark dots in the necrotic zones are nuclear remnants. The periportal tissue and the tubular peripheries are usually preserved. (Low power enlargement).

had swollen, poorly staining and often anuclear cells, but there were nowhere any extensive areas of necrosis. Calcareous deposits occurred as faint bluish dust within a few of the dead cells. Massive calcification was not present.

Arsenic from 0.0062 to 0.0074 gm. per 100 Grams (Survival One Day).—There were patches of tubular degeneration, but no definite necrosis. The red cells were fused and partly hyalinized.

HISTOPATHOLOGIC CHANGES PRODUCED IN THE KIDNEYS BY NEO-ARSPHENAMIN

Arsenic from 0.0036 to 0.0039 gm. per 100 Grams (Survival from Three to Ten Days).—In the three-day animal there were large irregular patches of necrosis and calcification involving the outer two thirds of the cortex. In the ten-day animal there were many irregularly distributed areas of degeneration and small patches of necrosis. Massive necrosis was not present, but most of the convoluted tubules had poorly staining, shrunken, granular epithelium with vacuolated bases and

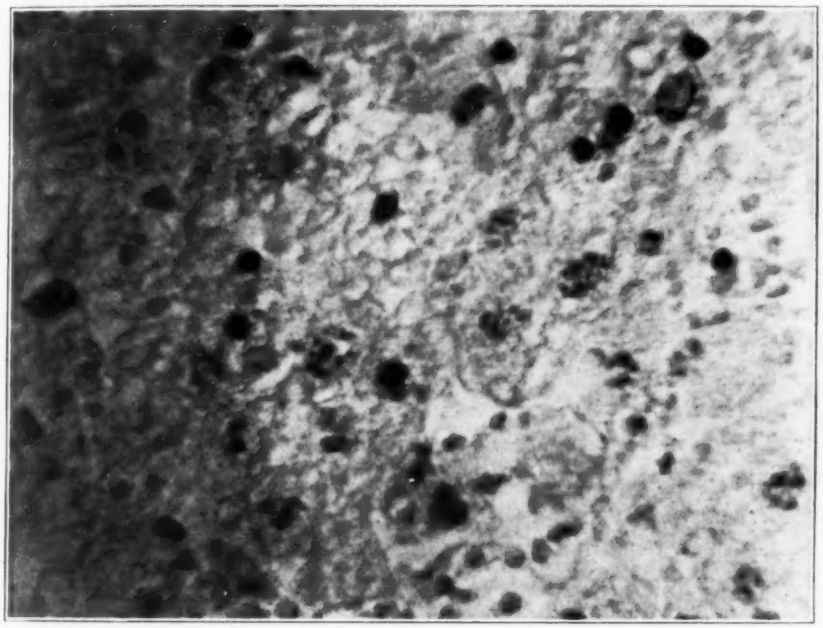

Fig. 7.—Liver of a rat that lived two days after receiving arsphenamin. Higher power enlargement of border of one of the necrotic foci shown in Figure 6. The cells have indefinite outlines; they contain fatty and hydropic vacuoles. Many types of nuclear changes are present; best seen are pyknosis (shrinkage, shown by small size and deep staining) and hyperchromatosis of nuclear periphery (the chromatin is collected into coarse clumps lying on the nuclear wall).

poorly defined cell boundaries. Many of the cells were anuclear and dusted with calcium deposits. There was much débris in the tubular lumina. The glomeruli were large; their coils were indistinct and often packed with a hyaline substance. The capillaries in general were not engorged. Here and there evidence of epithelial regeneration was present.

Arsenic from 0.0047 to 0.0057 gm. per 100 Grams (Survival One Day).—The vascular and degenerative changes were more pronounced than in the preceding group, but of similar nature. Small, irregular patches of early frank necrosis were present.

Arsenic from 0.0043 to 0.0059 gm. per 100 Grams (Survival Two Days).—There was widespread and often marked necrosis, involving particularly the outer half of the cortex. The necrotic tubules appeared as entirely anuclear, solid, dark red masses. This appearance was due to fusion of the necrotic cells with hyaline débris within the tubular lumina. The medullary tubules presented no noteworthy changes. Vascular lesions were of the usual types; many minute hemorrhages were seen. The glomeruli were usually very large and their coils packed with agglutinated erythrocytes.

Arsenic from 0.0043 to 0.0057 gm. per 100 Grams (Survival from Three to Six Days).—Extensive patches of necrosis were present in all animals, and in all but one these were heavily encrusted with calcareous deposits. Only the convoluted tubules and to some extent the thick tubules of Henle were involved. The necrosis and calcification were especially marked in the outer two thirds of the cortex. The glomeruli while often frankly necrotic were never calcified. The vascular changes varied considerably. In many capillaries, thrombi of conglutinated red cells were seen. Many minute hemorrhages were distributed through both cortex and medulla. In the animals surviving for four or more days, some evidence of epithelial regeneration (deep staining, occasional mitotic figures, etc.) were found.

Arsenic from 0.0064 to 0.0089 gm. per 100 Grams (Survival One Day).—The vascular changes comprised irregularly distributed engorgement, focal hemorrhages and agglutination of erythrocytes. There were many irregularly distributed patches of tubular degeneration and early frank necrosis. Changes in the cells ranged from cloudy swelling to loss of all structural details. In many places even the tubular outlines were indistinct; this seemed to be particularly the case in places in which hemorrhagic infiltration was most marked.

Arsenic from 0.0061 to 0.0077 gm. per 100 Grams (Survival Two Days).—Extensive necrosis, particularly in the outer parts of the cortex, characterized the changes. In one animal, calcareous infiltration of the dead tissues was present. The less necrotic tubules presented all stages of cellular degeneration. The vascular changes did not differ from those in the preceding groups.

Arsenic from 0.0062 to 0.0093 gm. per 100 Grams (Survival from Three to Six Days).—In all animals there were many hemorrhages and extensive necrotic patches, most marked in the outer two thirds of the

cortex. These were heavily encrusted with calcium salts. There was no necrosis of the medullary tubules. In the non-necrotic tubules calcified débris was frequently found. The vascular changes were like those of the corresponding preceding group. Some of the better preserved tubules exhibited indication of regeneration.

HISTOPATHOLOGIC CHANGES PRODUCED IN THE LIVER BY ARSPHENAMIN

Arsenic from 0.003 to 0.0039 gm. per 100 Grams (Survival One Day).—The vascular changes were similar to those in the kidneys. The

Fig. 8.—Liver of a rat that lived four days after receiving arsphenamin. Above the center of the illustration there is a roundish pale necrotic area. The periportal connective tissue near the middle of the right margin is loose and edematous. All of the vessels are engorged. Many areas of necrosis, some larger than the one illustrated, were present in the liver. (Low power enlargement.)

periportal fibrous tissue was frequently loosely arranged, mildly edematous, and the connective tissue cells were slightly swollen. Now and then moderate numbers of free polymorphonuclear leukocytes and erythrocytes were present. The bile ducts as a rule were normal, but occasionally slight mucoid degeneration was present. The capillaries were irregularly congested and often packed with agglutinated cells.

Often leukocytes occurred in conspicuous numbers among partly fused red cells.

The most marked parenchymatous changes consisted of small, irregularly distributed hemorrhages and areas of focal necrosis. The liver cells in the involved areas appeared to be fused, coagulated and hyaline. There was generally no invasion of the necrotic areas by wandering cells. In the non-necrotic portions the cells were much swollen, poorly outlined, coarsely granular and finely vacuolated. Two types of vacuoles were present: clear-cut, fat droplets and indefinite small hyaline vacuoles usually containing some eosin-staining precipitate. The nuclear changes varied considerably; they were most pronounced at the border of the necrotic zones. The earliest type of change observed was marked condensation of the chromatin at the nuclear wall. Here it occurred in the form of course, irregular clumps; the rest of the nucleus was pale. A later stage consisted in loss of the nuclear boundary, but the chromatin granules were still arranged in the form of a ring. This was followed by irregular scattering of the granules through the cytoplasm. Other types of nuclear degenerations occurred, but hyperchromatosis at the nuclear wall and later rhexis were most often seen. The vascular endothelium and particularly the Kupfer cells were somewhat swollen. Sometimes undoubted mitosis figures were encountered.

Arsenic from 0.0032 to 0.0037 gm. per 100 Grams (Survival Two Days).—The changes were similar to those described above, but on the whole more pronounced. There were numerous areas of focal necrosis and hemorrhage, both irregularly distributed, but sometimes more prominent near the lobular periphery. The better preserved liver cells were very swollen, and filled with fine, irregular vacuoles and larger clearcut droplets. The nuclear degenerations were like those previously mentioned.

Arsenic from 0.0039 gm. per 100 Grams (Survival Four Days).—There were everywhere small necrotic areas, frequently infiltrated with a few mononuclear and polymorphonuclear cells; such areas occurred more often in the outer third of the lobules. The capillaries were prominently injected. The liver cells were swollen; there was much vacuolization, and many nuclei showed profound degenerative changes.

Arsenic from 0.004 to 0.0058 gm. per 100 Grams (Survival One Day).—Agglutination of the red cells was pronounced. The perivascular tissues were moderately edematous. There were numerous focal hemorrhages and small areas of early necrosis usually without any cellular reaction. The liver cells were swollen, coarsely granular and contained small indefinite vacuoles as well as clear-cut fat droplets.

Arsenic from 0.0041 to 0.0052 gm. per 100 Grams (Survival Two Days).—In sharp contrast to the changes in the kidney there were found here in all animals extensive areas of necrosis and hemorrhages often involving all but the lobular peripheries. In some areas the tissue could hardly be recognized as liver. Many non-necrotic liver cells contained hyaline droplets. The red cells were usually agglutinated, and in the clotted masses the polymorphonuclear leukocytes appeared to be increased in number. In the bile ducts, the epithelial cells often contained an excess of mucous.

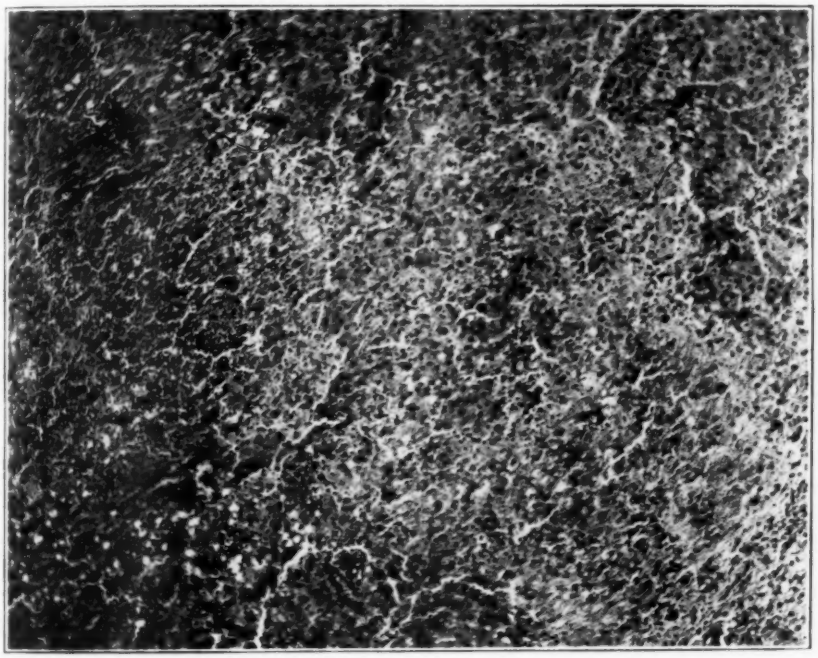

Fig. 9.—Liver of a rat that lived one day after receiving neo-arsphenamin. Large areas are flooded with partly conglutinated erythrocytes. On the left, the red cells are densely packed and appear as a dark granular mass. In the right lower corner, they are less densely massed and take a lighter stain. The pale portions about the middle of the illustration consist of disintegrated erythrocytes.

Arsenic from 0.0043 to 0.0059 gm. per 100 Grams (Survival Four Days).—There were a number of pale, necrotic areas which varied much in size and distribution. Some involved only a few cell groups, others took in what appeared to be several lobules. Many consisted of smooth, hyaline material; in some places, however, the areas were somewhat granular. Within the dead areas, there were often seen rows

and groups of erythrocytes, leukocytes and some endothelial cells. The explanation of this is that the cords of the liver cells had undergone complete coagulation necrosis and appeared as hyaline bands. Smaller necrotic areas were often seen, many of which presented a fine fibrillar arrangement that was not unlike a closely woven, coarse, fibrin network. Some of the smaller necrotic areas which involved only a few cells were invaded by polymorphonuclear leukocytes. As a rule, however, there was no tissue reaction at the periphery of the necrotic regions, while the necrotic areas were exceedingly irregular in their distribution, a few were distinctly at the lobular peripheries. The vessels contained partly fused red cells. In some, the mass had undergone almost complete fusion; elsewhere the individual cells could still be recognized. The perivascular tissue was loose and edematous; there was partial degeneration of the biliary ducts. The better preserved areas showed somewhat swollen cells with indistinct outlines and somewhat pale nuclei. It is to be emphasized that the necrotic regions were not only irregularly distributed so far as their position within the lobule was concerned, but they likewise involved irregularly distributed portions of the liver.

Arsenic from 0.0062 to 0.0074 gm. per 100 Grams (Survival One Day).—There were numerous minute hemorrhages, but nowhere any areas of necrosis. The liver cells were moderately swollen and vacuolated.

HISTOPATHOLOGIC CHANGES PRODUCED IN THE LIVER BY NEO-ARSPHENAMIN

Arsenic from 0.0036 to 0.0039 gm. per 100 Grams (Survival from Three to Ten Days).—There were nowhere any areas of necrosis, but occasional focal hemorrhages were present, especially in the ten-day animal. The capillaries were moderately engorged; the liver cells were usually swollen and finely vacuolated.

Arsenic from 0.0047 to 0.0057 gm. per 100 Grams (Survival One Day).—There were nowhere any areas of necrosis. The liver cells were moderately swollen, indefinitely outlined, and usually finely vacuolated.

Arsenic from 0.0043 to 0.0059 gm. per 100 Grams (Survival Two Days).—In contrast to the kidney, there were nowhere any areas of necrosis, but occasional small foci of hemorrhage were encountered. The hepatic cells were swollen, poorly outlined, often vacuolated, and frequently contained hyaline droplets. The capillaries were usually distended and contained a conspicuous number of leukocytes.

Arsenic from 0.0043 to 0.0057 gm. per 100 Grams (Survival from Three to Six Days).—No necrosis occurred in any of the animals. There were irregularly distributed capillary engorgement and occasional focal hemorrhage. In many sections, the liver cells were practically normal; at most, they were somewhat swollen and had poorly defined outlines; the nuclei generally stained well.

Arsenic from 0.0064 to 0.0089 gm. per 100 Grams (Survival One Day).—There were numerous focal hemorrhages, and in a few animals occasional necrotic patches, but on the whole the liver cells were fairly well preserved, or showed only swelling and indefinite cytoplasmic vacuolization. The necrotic foci were frequently invaded with leukocytes and flooded with red cells.

Arsenic from 0.0061 to 0.0077 gm. per 100 Grams (Survival Two Days).—Only in one animal were small necrotic foci encountered. The liver cells were generally fairly well preserved, but many were swollen and contained fat and hyaline droplets. Focal hemorrhages were commonly seen. The capillaries were irregularly distended with partly agglutinated red cells.

Arsenic from 0.0062 to 0.0093 gm. per 100 Grams (Survival from Three to Six Days).—In none of the animals was necrosis present, but there were occasional focal hemorrhages. The liver cells were usually swollen, granular and often contained fine fat vacuoles or hyaline droplets. Many sections were quite normal.

The following is a brief synopsis of the main histologic changes produced in the liver and kidneys by arsphenamin and neo-arsphenamin; these changes are arranged in parallel columns in order to bring out at a glance the greater hepatotoxic effects of neo-arsphenamin:

SERIES A

ARSPHENAMIN	NEO-ARSPHENAMIN
0.003 to 0.0039 gm. as per 100 gm.	0.0036 to 0.0039 gm. as per 100 gm.
Liver: Slight edema of the periportal connective tissue; partial agglutination of erythrocytes; minute irregularly distributed hemorrhages and areas of focal necrosis; cloudy swelling and some fatty and hydropic vacuolization of cells. Marked focal necrosis after the 0.0039 gm. dose.	Liver: Many areas of focal hemorrhage but no evidences of necrosis.
Kidneys: Irregularly distributed patches of degeneration in convoluted tubules with more extensive necrosis and calcification in the inner cortex after the 0.0039 gm. dose.	Kidneys: Massive tubular necrosis with calcification in outer cortex.

SERIES B

ARSPHENAMIN	NEO-ARSPHENAMIN
0.004 to 0.0059 gm. as per 100 gm.	0.0043 to 0.0057 mg. as per 100 mg.
Liver: Many foci of beginning necrosis and focal hemorrhages. With the larger amounts of arsenic, extensive focal necrosis and hemorrhages often involving all but the lobular peripheries. Polymorphonuclear leukocytes in increased numbers within masses of conglutinated erythrocytes. Many liver cells contained hyaline droplets.	Liver: Cloudy swelling and fine vacuolization of liver cells; no areas of necrosis. Few small foci of hemorrhage.
Kidneys: Irregularly distributed areas of hyperemia, especially in the boundary zone, with conglutination of erythrocytes. Irregular areas of tubular degeneration but no areas of extensive necrosis.	Kidneys: Areas of hyperemia, focal hemorrhages and conglutination of erythrocytes. Extensive tubular degeneration but widespread necrosis and calcification.

SERIES C

ARSPHENAMIN	NEO-ARSPHENAMIN
0.0062 to 0.0074 gm. as per 100 gm.	0.0061 to 0.0093 gm. as per 100 gm.
Liver: Many hemorrhages, often extensive in distribution; swollen and vacuolated liver cells with areas of necrosis.	Liver: Occasional small focal hemorrhages; slightly cloudy swelling of the liver cells in some areas. Small areas of necrosis in a few animals.
Kidneys: Conglutination and partial fusion of erythrocytes; few patches of tubular degeneration but no definite areas of necrosis.	Kidneys: Conglutination and partial fusion of erythrocytes; numerous hemorrhages. Marked necrosis and extensive areas of necrosis with calcification, particularly in the outer parts of the cortex.

SUMMARY

The histopathologic changes produced by single large doses of arsphenamin and neo-arsphenamin injected intravenously into rats may be summarized as follows:

1. There were great individual variations in the histologic changes produced in the different animals; these variations may have been due to differences in susceptibility of the animals and to slight differences in the toxicity of the several preparations of arsphenamin and neo-arsphenamin employed.

Since arsphenamin appears to be relatively more hepatotoxic and neo-arsphenamin relatively more nephrotoxic, the former compound should not be used in patients with clinical evidence of disease of the liver; neo-arsphenamin would seem to be the preferable compound

in such cases. On the other hand, arsphenamin would appear to be the safer compound in patients with evidences of renal disease.

2. Both compounds cause more or less marked vascular changes consisting of swelling of the endothelial lining, and of agglutination and partial fusion of the red cells. These phenomena are most pronounced in the capillaries. There is usually irregularly distributed engorgement. On the other hand, the capillaries are collapsed in some areas; this is probably due to clotting in the stem vessels. Hemorrhages appear to occur with equal frequency after arsphenamin and neo-arsphenamin, and they are often large, and usually more marked in the liver than in the kidneys. Conspicuous numbers of leukocytes are often embedded in the agglutinated erythrocytic mass. This occurs with sufficient regularity to allow the thought that the frequent leukopenia after arsphenamin and neo-arsphenamin may be due to the retention of the white cells within the internal organs.

3. Arsphenamin produces particularly degenerative and necrotic changes in the liver; in the kidneys, there is always found some degeneration of the convoluted tubules and thick limbs of Henle, but frank necrosis rarely occurs.

4. Neo-arsphenamin produces particularly marked degenerative and necrotic changes in the kidneys. Some cytoplasmic swelling with granularity and vacuolization usually occurs in the liver, but necrosis is relatively rarely found.

5. The action of arsphenamin and neo-arsphenamin on the liver and kidney was best brought out in animals that survived from two to four days after injection. Animals dying within one day showed less striking histologic differences.

6. It must be emphasized that the histopathologic changes described were produced in rats by single lethal doses of arsphenamin and neo-arsphenamin from ten to fifteen times larger than those administered at one time to human beings per kilogram of body weight.

XXXVI.—PATIENT WITH DIABETIC DERMATITIS TREATED WITH INSULIN *

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AND
THOMAS J. CALHOUN, M.D.
ST. LOUIS

Dermatitis is relatively common in diabetic patients. It is usually persistent, and sometimes intractable. We therefore believe that the following case report is of interest in view of the quick relief and apparent cure of diabetic dermatitis of five years' standing by means of insulin.

REPORT OF CASE

A white woman, aged 59, entered The Barnard Free Skin and Cancer Hospital Dispensary on July 30, 1923. The family history for diabetes was negative. The patient had had the usual diseases of childhood. The menstrual history was negative, except for a persistent dysmenorrhea. She had never been pregnant.

For the past ten years she has had prolapse of the uterus. During the same period she has suffered from attacks of arthritis, and an arthritis deformans exists at present, but there is no evidence of an eruption about the joints. About five years ago, the patient began to notice an increased thirst with a particular craving for sweets. These symptoms became exaggerated along with polyuria and nocturia. There was a gradual loss of weight and strength, and the skin generally was dry.

The dermatitis first made its appearance about the vulva five years ago, and when treated locally would disappear temporarily. The attacks were repeated, each one progressively worse. Two years ago the eruption became permanent.

From the vulva the lesions spread peripherally to the inner surfaces of the thighs, to the perineum, mons veneris and on the lower part of the abdomen to the level of the umbilicus. About one year ago, the eruption made its appearance in both axillae and under the breasts, which were large and pendulous.

At the first examination the distribution was found to be in the areas above described. The eruption consisted of confluent papules, intensely inflammatory, excoriated and weeping, with areas of lichenification and pigmentation.

Around the confluent patches were scattered discrete papules which were red and excoriated from scratching due to the intense pruritus which existed (Figs. 1, 2 and 3).

During the first nine days the patient was under observation, she was treated with the usual local applications and given dietetic directions. As there was

* Studies, reports and observations from the dermatological departments of The Barnard Free Skin and Cancer Hospital and the School of Medicine, Washington University, St. Louis, Mo., U. S. A.; service of Drs. M. F. Engman and W. H. Mook.

Fig. 1.—Diabetic dermatitis in genitocrural region.

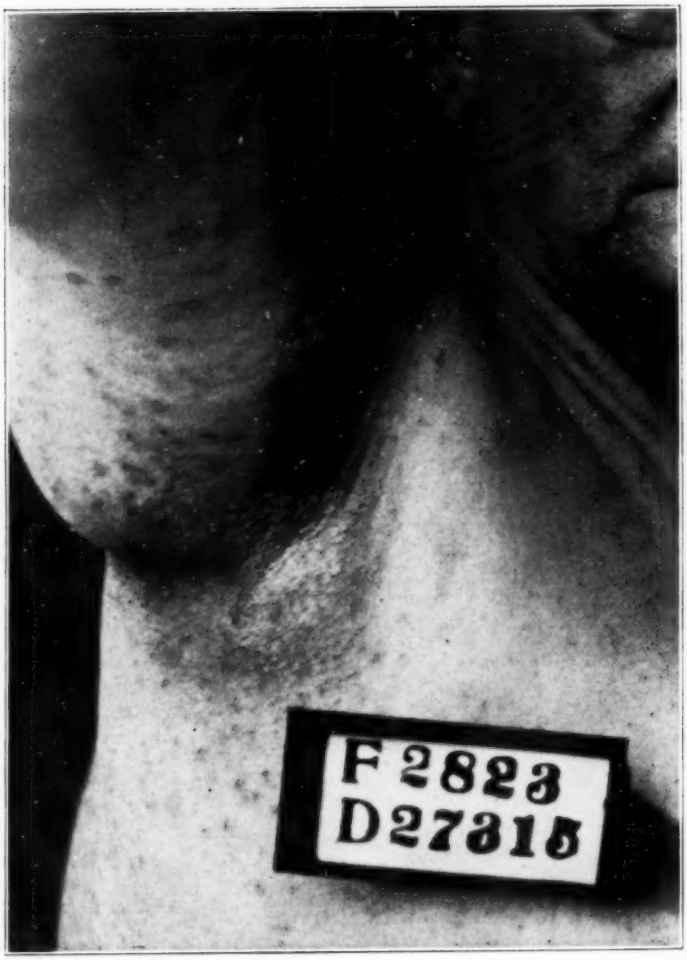

Fig. 2.—Diabetic dermatitis in the axilla.

no improvement in her condition, she was admitted to the hospital on August 8 for insulin treatment.

The blood contained 4,570,000 red blood cells, 13,700 white blood cells and 80 per cent. hemoglobin. The blood sugar was 0.3. The urine was cloudy, acid in reaction, with a specific gravity of 1.032. One drop reduced 3 c.c. of Benedict's solution. Acetone was present. The microscopic examination showed a few hyaline casts with many epithelial cells.

The patient on admission was immediately restricted to a starvation diet and remained on this until August 13, when the urine became sugar and acetone free. The blood sugar was reduced to 0.25. On this date treatment with insulin was inaugurated, the patient being given 10 units.[1] From August 14 to September

Fig. 3.—Diabetic dermatitis of the breast and adjoining region.

1, inclusive, she received 10 units of insulin twice daily. From September 2 to September 15 inclusive, she received 10 units once daily. The blood sugar was reduced gradually to normal limits.

The patient was given a gradually increased diet from August 13. Daily examination of the urine failed to reveal the presence of sugar. On August 18 the first definite improvement in the skin condition was noted. There was a lessening of the weeping, and the inflammation was reduced in intensity. On August 21 the patient stated that the itching was not so severe. From August 21, there was a rapid involution of the skin condition, along with a general improvement of all other symptoms. The patient was discharged from the hospital on September 16, 1923, as clinically cured.

1. Lilly units.

THE PATHOGENESIS OF DERMATITIS, INCLUDING ECZEMA

A CASE OF ENGLISH IVY POISONING *

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The response of tissue to a pathogenic agent or agents depends upon a local peculiarity inborn or acquired. Either way it is anatomic or physiologic, and if acquired may be the result of changes due to growth or previous disease. Anatomic factors are purely structural and depend on the quality and quantity of the tissue, whether connective or parenchymatous, and the ratio of the two. Physiologic factors are functional and depend on the type of function; whether glandular, and if so the kind of gland and secretion; or vascular, and if so whether blood or lymph; or nerve, and if so whether sensory, motor, trophic, sympathetic or special. In the skin, which is a most complex composite of other complex organs and tissues, this is no less true. At different periods of life, infancy, childhood, adolesence, maturity and senility, the skin is altered both as to structural and functional characteristics. Preceding cutaneous diseases cause further structural and functional modifications. Thus, almost from year to year, beginning at the cradle and ending with old age, the skin exhibits a series of alterations which determine its potential of morbid responses.

Subtle as these are, considering our basic ignorance of their nature and significance, still subtler are the general physical and physiologic factors of the body as a whole, which influence the skin no less. Here also the groups of factors may be divided as in the skin itself, and added thereto are racial factors, disturbances and diseases of metabolism, the ductless glands, and the great digestive, eliminatory, nervous, circulatory and secretory systems, chronic infections, notably tuberculosis, and disturbances of the blood cell producing organs.

The condition called eczema is among those dermatoses which best lend themselves to pathogenic analysis. In a recent study I advanced the following definition of this syndrome: "Eczema is a catarrh of the skin possessing the pathological characteristics of an exudative inflammation. It is characterized clinically by redness, swelling, the presence of papules, vesicles, pustules, weeping, crusting and scaling in varying combinations. In its course it may be acute, subacute, chronic, and its origin depends upon an interplay between various known and unknown

* Read at the Forty-Sixth Annual Meeting of the American Dermatological Association, Ann Arbor, Mich., June 7-9, 1923.

local and predisposing causes, to which the skin lesions are reactions." During the seven years which have elapsed since the foregoing conclusions were set down, all of my experiences have been rather in the direction of their support than away from it, and a patient recently under observation illustrates all of the points involved. The condition in question was one of dermatitis of the face, neck and upper extremities. It proved to be the second of its kind in the literature, in that it was provoked by the English ivy, Hedera helix, of the order *Araliaciae*. Munro [1] reported the first case. The case to be described had been observed by three eminent dermatologists, one of whom considered it eczema of internal origin; one, seborrheic dermatitis; and one, dermatitis venenata.

REPORT OF A CASE

History.—S. J., British, aged 50, a house steward in a wealthy Long Island home, first presented himself on Dec. 15, 1922, suffering with a disturbance of a year's duration. It was an eruption which began with itching and flushing of the face, neck and upper extremities, and rapidly evolved into the conventional picture of erythematovesicular, papular, weeping and crusted dermatitis. Susceptability to *Rhus* had been noted by the patient, but in spite of avoiding this plant he was harassed by recurrences. Under treatment in Baltimore in June, 1922, the outbreak disappeared, but on returning to his own environment, particularly late in the fall, he had numerous attacks. A prominent New York dermatologist regarded the illness as seborrhea, and numerous metabolic studies made by him revealed no abnormalities. Another dermatologist of equal standing interpreted the picture as that of dermatitis venenata but failed to isolate the agent. At this point I first saw him. His general history was negative, his habits good, and he had never had any serious illnesses.

Examination.—This revealed that an acute dermatitis, as described, was present. The patient was a lean man, apparently organically sound.

Course.—Under lotions and wet dressings the eruption faded in three days. Some of the lesions having suggested small wheals suprarenal gland substance was prescribed, and fractional (one-fourth maximum skin dose) roentgen irradiation was employed because scaling had set in.

On Dec. 22, 1922, the patient inquired whether English ivy could produce his disease, mentioning that he handled it in connection with the floral decorations of his employer's house. This seemed a clue, and ivy leaves and stems were applied to his unbroken skin after the manner described by Markley in his investigations on guinea-pig hair dermatitis. There was no reaction. An alcoholic extract was prepared of the leaves and stems, and, with a stock solution, as well as with a residual powder recovered by evaporation from the alcoholic solution of the leaves and redissolved in decinormal sodium hydroxid, percutaneous tests were made, all of which were strongly positive. The reaction consisted of a small wheal surrounded by a broad red zone, and it lasted twenty-four hours. Local controls made with the two solvents were negative, as were complete control tests on Dr. R. H. Rulison and myself.

1. Munro: Australian M. Gaz., Jan. 20, 1900.

This appeared to explain the etiology, but roentgen-ray treatment was continued for the scaling, and by December 29, or within two weeks, the eruption had disappeared. On Jan. 12, 1923, when the color of the skin had returned to normal, two spots as large as a half dollar were noted on the left side of the forehead. They were flat, brownish red, and scarcely infiltrated. They were evidently involved seborrheic patches, and the face and neck showed slight traces of this condition, which were easily controlled by the roentgen rays, although the two spots on the forehead tended to light up from time to time without, however, becoming vesicular. All other local treatment had been stopped after the first three days. On April 11, 1923, and again on April 25, the skin was slightly red. This was obviously due to sunburn. On the latter date the percutaneous tests were repeated with the original positive result.

Summary.—A man, aged 50, with a seborrheal skin, suffered repeated attacks of acute dermatitis. He was susceptible to English ivy. On discontinuing exposure to it, his attacks ceased. Specific percutaneous tests, properly controlled, were positive.

Munro's Case.[2]—The eruption in this case resembled zoster. "It began after the application of ivy leaves and vinegar to corns; later it always recurred in the same person whenever wet ivy leaves were touched."

COMMENT

The fact that three sound observers respectively considered an eruption eczema, seborrheic dermatitis and dermatitis venenata, is striking. It signifies either that there is not, or cannot be, clinical unanimity in such cases, or that at different periods in the course of the case the picture varied. It further signifies that there is no difference between eczema and dermatitis, whatever their origin. As to unanimity, this, paradoxically enough, is lacking because standards of differentiation between eczema and dermatitis are so subjective as actually to fail as criteria, a convincing testimonial to their identity. If at different moments the same disease has three different aspects, again all criteria fail. Thus, the clinical avenues lead to axiom one. If this is so, the time honored debate waged over the relationship of eczema and dermatitis thrives either because of failure to grasp essentials, or because of emphasis on nonessentials.

There are only two possibilities: Eczema and dermatitis are either identical or different. To hold that sometimes they are the same and sometimes not is evasive. The word "eczema" does not seem nearly as objectionable as the confusion engendered by trying to distinguish eczema from a disease just like it. It is perhaps immaterial whether one term is abandoned, or the other. Eczema venenatum would be as good as dermatitis of unknown origin, if the former were synonymous

2. Munro, in White, Prosser: Occupational Affections of the Skin, New York, Paul B. Hoeber, 1920, p. 248.

with dermatitis venenata, and the latter with eczema of unknown origin. What counts is clarity as to the nature of the disease whichever name is favored. It is not a matter of Totem worship of a word. The point is that the two concepts are identical, as the case reported shows, and to support this view it will be necessary to analyze pertinent passages from the literature, as well as certain more restricted phases of the case in question.

THE LITERATURE

Willan and Bateman [3] thought that eczema could be either of external or internal origin. Hardy [4] restricted the disease to internal causes. Biett, Cazenave and Schedel [5] believed that whether it originated from within or without, predisposition was the salient factor, an illuminating point of view for so many generations ago; and Bazin [6] more trenchantly referred to the disease as a "special reaction of the skin to diverse causes." In Austria and Germany, as the teachings of Hebra, Neumann and Unna show, it was maintained that the origin was purely external, while the later English writers, particularly Erasmus Wilson and Tilbury Fox, subscribed to Willan's original views with minor modifications.

It is unnecessary to dwell on the relationship emphasized in France of the dartrous, and in England, of the gouty, diathesis to eczema. These are words indicating a veiled insight into the subtle metabolic disturbances related to this cutaneous reaction. They merit their obsolescence, for modern knowledge in this domain, though still deficient, has some glimmerings of greater certainty. Equally unsound explanations have been the fruit of a not far distant past, preeminently nervousness and functional disorders. Besnier,[7] however, makes a notable contribution to the subject in pointing out the causative probability of general and local predisposition, and among the latter particularly other skin diseases and physiologic and anatomic disturbances of the skin.

The work of Johnston, Fordyce, Towle and Talbott, Charles White, Ramirez, Knowles and myself indicate how closely Americans have been engaged with the problem during the last twenty years. Because of their recency the views of these writers require no repetition. Norman Walker in Scotland, and in this country Pusey, Engman and I have

3. Willan and Bateman: A Practical Synopsis of Cutaneous Diseases, 1815, p. 252.

4. Hardy: Leçons sur maladies de la peau, 1860, p. 2.

5. Biett, Cazenave and Schedel: Abrégè' pratique des maladies de la peau, 1838, p. 90.

6. Bazin: Leçons theoriques et cliniques sur les affections de la peau, 1862, p. 138.

7. Besnier: Pratique dermatologique **2**:1.

not evaded the identity of eczema and dermatitis. Pusey, in his text-book, has best summed up the case in an analysis of Malcolm Morris' equivocations. "It makes no difference," asserts Pusey, "in the essential character of a dermatitis that the irritant happened in some cases to be discoverable and in others not. Leaving out these unessential qualifications, we cannot avoid the position that eczema is dermatitis; and as far as the lesions in the skin are concerned, this statement represents the fact."

At the fourth International Dermatological Congress, Unna reported the isolation of a specific eczematogenic bacterium, the morococcus. This was vigorously assailed by virtually all of his hearers. It is likely, however, that any parasite may be among the causes of dermatitis, precisely as are the epidermophyton and other fungi. In fact, the recent studies that have assailed the standing of dyshidrotic eczemas among dermatoses, have shown that Koebner's epidermophyton not only causes Hebra's eczema marginatum, but that related organisms may give rise to the picture of eczema in all of its nuances.

A bird's-eye view of the literature reveals the wide latitude covered by speculation as to the cause of eczema. Ignoring the more obvious possibilities, such as gross alimentary disturbances, and vague ones, nervousness, diatheses and the like, the following theories have been advanced since the days of Willan, or even earlier (Lorry), and at the present time. General predisposing causes, local causes, local irritants of whatever type, and combinations of these have all been cited. But it was Bazin and Besnier who envisaged the condition with most acute and prophetic eyes. It is their combined conception which seems fundamental for an enlightened understanding of the disease.

THE PATHOGENESIS OF ECZEMA

To produce eczema, and perhaps also many other skin diseases, the chain of events has three important links. They are the group of underlying causes, the group of local causes, and that of the precipitating causes. First among underlying causes are disturbances of nitrogen, carbohydrate and possibly fat metabolism, from ingestion to elimination, including the subtler chemical phases, and depending on the gross or fine organic changes that may be present in the various involved systems. Second are endocrine disturbances, both as such and in their reciprocal relation to metabolism. The ductless glands are to be considered even more seriously in relation to the metabolic factors of development and decline, infancy, childhood, puberty, adolescence, maturity and age—particularly puberty and the climacteric. Above all, the thyroid and suprarenal glands are to be emphasized, and in a lesser degree, no doubt, the pituitary body and gonads. Third are the phenomena included under our modern concepts of susceptibility, hypersuscepti-

bility and idiosyncrasy, embracing anaphylaxis. A group subsidiary to the more important ones is that of diseases causing inanition, namely, general malignancy and infection, and cryptic or focal infections or their effects, bacterial intoxication.

Local causes are anatomic, the character of mucocutaneous junctions, body folds, the hair distribution in these folds or elsewhere, or functional, the pilosebaceous or sudorific systems; or physiologic, as the higher temperature and greater moisture in the folds, or the various skin secretions; or pathologic, as ichthyosis, hyperhidrosis, steatosis; or the local flora; or the effect of previous general or local disease on the anatomy, physiology or function of the skin; and finally, allergy.

The precipitating causes are physical, chemical, parasitic and anaphylactic. Physical causes include thermal and actinic factors. Chemical causes include the various organic and inorganic substances of all derivations. Parasitic causes include the various flora inhabiting the skin, or epizootic creatures with their peculiar toxins, secretions and excretions. These toxins, together with those of plant and animal origin include anaphylotoxins, or substances working analogously, for if anaphylaxis and allergy indicate a peculiar response of the organism to alien protein, many nonprotein substances seem to have a similar, if not identical, mode of attack, such as *Rhus*, or the primrose.

Nor must it be overlooked that precipitants remain innocuous unless conveyed to the vulnerable tissue. This depends on qualities of environment, habit or occupation. In short, there must be exposure.

A complexity enters the outline at this point, for if the underlying disturbance should be metabolic, substances may be eliminated in the skin secretions whose very presence furnishes irritants capable of acting as precipitating causes on a susceptible integument. The element of exposure would not have to be regarded in such instances. Even without an actual underlying disturbance the secretions of the skin might be altered in quantity or quality, so as to act in the same way. This indicates that the skin itself, being part of the whole body, may supply the underlying, local and precipitating factors; but the fact is not altered that the three must be represented to cause the reaction called eczema. Otherwise regarded the skin alone is able to furnish all of the necessary elements. The body may supply two of these, the underlying and precipitating factors; or the body may supply one, the skin one, and exposure the third. To deny this is not to understand eczema. To accept this is to understand that the only difference between dermatitis and what is called eczema is whether the precipitating factor has, or has not, been supplied through exposure. If it has, some of the irritants may be in higher concentration, or may vary so in nature that they provoke grosser differences in the lesions, but not in the nature or essential features of the lesions; nor is there often any difference. Two other-

wise identical conditions cannot be regarded as distinct, simply because in the one we know what the precipitant is, and how it reached its destination, and in the other we do not. If tradition is so compelling that the designation eczema cannot be thrown off, let the alternative one, dermatitis, be discarded, so that one disease will no longer be looked on with intellectual diplopia. To sacrifice the word eczema would be my preference, the grounds for doing so being good, and because it would be desirable to rid medicine of all fanciful terms that do nothing to further understanding.

To sum up, eczema is the result of interoperation among underlying, local and precipitating forces. If any one of these is missing the chain is broken. It is obviously difficult always to discover the underlying cause, but it is often equally difficult to isolate the precipitating one, because there are so many elements in habit and environment of which the patient himself is unaware. It might require a sorcerer rather than a chemist to divine the one, and all the talent of Scotland Yard to detect the other. But success tarries if obstacles are regarded passively.

THE BEARING OF THE CASE REPORTED ON THE FOREGOING

The patient under consideration had an eruption called eczema by one dermatologist, seborrheic dermatitis by another and dermatitis venenata by a third. How subjective the factors influencing diagnosis and how uncertain the data molding conclusions! English ivy provoked this eruption, and the fact that seborrhea was present became apparent only as the masking lesions faded. Thus each of the three dermatologists was partly, but only partly, right. Hypersusceptibility was proved by controlled experiment. The chain was complete, an underlying cause, hypersusceptibility; a local predisposing cause, seborrhea, and allergy (or there would have been no percutaneous reaction); and a precipitating cause, English ivy. Lastly, there was exposure through handling this plant.

To break the continuity of these forces the simplest procedure is that of preventive medicine, to end exposure. Immunization might eliminate the underlying cause, as Strickler's work on rhus poisoning indicates. The effect of the roentgen rays on seborrhea might so alter the skin as to remove the local cause, thus destroying response to the excitant. So much for theory. Practice would dictate the removal of exposure to disturb the sequence, and next in feasibility would be immunization. In Munro's patient sensitization had been created by use of the plant for therapeutic purposes. This is strikingly like anaphylaxis.

CONCLUSION

A lucid survey of the problem of eczema, both in general as well as in individual cases, requires the recognition of the need to discover the

underlying, local and precipitating cause, and whether there has been exposure. It is often impossible to accomplish this, probably because of imperfection in methods of study, as well as ignorance of much that will be revealed to physicians of an approaching day, probably too, and to no small degree, because many patients are oblivious to trifling items in their habits, surroundings and work, that would be important if only realized. These difficulties are inherent, but the broad, general, significant principles are eloquent in the report recorded, and it seems wilful not to listen.

To call eczema dermatitis of unknown origin indicates only intellectual supineness. It is subservience to an elusiveness in the nature of what must be captured in order to secure knowledge, an elusiveness that might have sustained the mystery in the case here reported, had it not been for a patient with the gift of sharp observation, and a series of investigations that happily were fruitful. Nor would this study have much point had the diagnosis not been severally eczema and seborrheal dermatitis in a patient with dermatitis venenata due to a plant only once before recognized as pathogenic.

Many other texts are discernible in what has preceded, but the outstanding one is that dermatology should become something dedicated less to nomenclature than to analytic study. Call a skin affection eczema, and at once a barrier arises to the solution of its genesis. Call it dermatitis, and the barrier seems flimsier. Words produce unconscious biases, and eczema has for so long been regarded as an enigma, while dermatitis has not, that half the battle in obscure cases would be not to think of them as eczema, but as dermatitis. Eczema, so far as the medical attitude toward it is concerned, is a negation. It is ultimately positivism that will dominate this attitude if the proper habit of regarding the disease is allowed to grow. This was the determining factor in Markley's work on guinea-pig hair dermatitis. So it was, too, in Walker's investigations on primrose poisoning and Everett Lain's on dermatitis referable to lycopersicum. And this factor is basic to an enlightened grasp of the problems of occupational dermatoses. To recognize it will confer the boon of a far meagerer dermatologic vocabulary, and a desirable increase in pertinent fact to the cutaneous medicine of tomorrow.

DISCUSSION

DR. CHARLES M. WILLIAMS, New York: Dr. Highman's paper is rather difficult to discuss. First, I should like to report briefly a case of dermatitis due to geraniums. The patient was a woman who had had a dermatitis for many months and who had been treated with all the various remedies we know of until the geranium was removed, when the trouble promptly cleared up. I think Dr. Highman has done us a service in calling attention to the fact that many articles are irritating to certain skins and not to others.

I must disagree with him in his tirade against the use of the word eczema. In many cases all three things are at work, the local condition of the skin, the condition of the blood and the irritant. Dr. Highman stated that the condition could be produced by the blood or the skin. Those are the cases known as eczema. We do not know what the irritant is in most of the cases. In external dermatoses we often cannot find any personal peculiarity. The cases range from those which many of us like to call eczema in which there is no discoverable cause except the internal condition to those in which the external irritant is the essential factor. I agree with Dr. Highman that it is often impossible to tell them apart.

Dr. Henry J. F. Wallhauser, Newark: I doubt that many physicians are using the word eczema except to patients. If a cause for any given case of dermatitis cannot be determined, it would seem preferable to admit our inability, than to substitute an indefinite term. Since discarding the word "eczema" in our clinic five years ago, we have found the cause in many cases of dermatitis which would otherwise have been passed over lightly under the title of eczema. I would, therefore, urge its discontinuance.

Dr. John H. Stokes, Rochester, Minn.: The identification of the etiologic factor in eczema or dermatitis is not in my experience entirely covered by systematic questioning. I recall a woman who received almost as thorough a work-up as Dr. Highman and Dr. Markley employed in their reported cases. She assured us that she had never had a primrose. Immediately upon her return home she discovered one in the center of the dining room table which had been given to her more than a year before on the occasion of the birth of one of her children. She threw this plant out and told two of her neighbors about it, and three cases of primrose dermatitis were cured forthwith. Dr Mook has emphasized the importance of attempting to collect samples of the entire environment to try out on the patient, but this in some cases is extremely difficult. The successful unraveling of the etiology in obscure cases such as Dr. Highman reports is a tribute to the indefatigable zeal and perseverance of the individual dermatologist.

Dr. Fred Wise, New York: I always listen with a great deal of respect to Dr. Highman's talks on this subject, but I arise to say that in the present state of our knowledge we cannot say that eczema and dermatitis are the same thing. Let us imagine that a patient is suspended in a room with nothing around his naked body except the air. If you rub that patient with *Rhus* leaves he will have an attack of dermatitis venenata. For the eruption resulting from contact with poisonous substances, the name dermatitis is still the best designation. Eczematoid eruptions arising from unknown (and presumably internal) causes are best classified as eczemas. If our suspended patient were to get a certain peculiar eruption which we call "eczematoid" without coming in contact with poisonous substances, such an eruption would, in the present state of our knowledge, be designated as an "eczema."

Dr. John A. Fordyce, New York: It seems to me that the most serious problem is the manner in which this subject should be presented to students of dermatology. As it is usually taught, the student has a vague idea as to what eczema is. I endeavor to classify under the head of eczema or dermatitis, various kinds of skin reactions: first, those due to irritants of various types; second, those of toxic origin, originally described by Engman; and third, those due to the ringworm fungus. In addition we have the infantile type of eczema in which possibly some defect in food metabolism is present, and the

senile type in which there is possibly some defect in the skin. Classified in this manner it seems to me that students have a much better idea of the subject than they usually acquire.

Dr. J. Frank Schamberg, Philadelphia: I am afraid that Dr. Highman in his desire to get away from the use of the term eczema is setting up another fetich—dermatitis. If we were to inform our patients that they were suffering from an inflammation of the skin instead of latinizing the diagnosis, the reply would doubtless be that that was obvious. The term dermatitis is too vague in a clinical sense to connote anything definite. In its anatomic significance it would include all inflammatory dermatoses. It so happens that in the course of decades there has been a sharpening of clinical acumen which has led to the elimination of the itch, lichen planus, dermatitis venenata and other dermatoses formerly included in the category of eczema. This process of elimination will doubtless go on.

For purposes of teaching, and more important still, for our own mental orientation, it is important to retain the term eczema, for many cases of this affection are unquestionably of internal origin. As soon as an eruption of an eczematoid character is demonstrated to be due to an external cause, it ceases to be an eczema. I see no reason for the abolition of the designation eczema just because clinical differentiation may be difficult. In my opinion the "localist" view of the causation of many dermatoses is being too much emphasized, and the adoption of the term dermatitis might subconsciously tend to warp our attitude still more.

Dr. William Allen Pusey, Chicago: I wish to express my entire accord with all the essentials of Dr. Highman's paper, and it seems to me that the thing to do is to deal with the essentials and bring out these points. I should not call his paper a diatribe in any sense, but merely a sharp, intellectual study that hews close to the line of reason. The question resolves itself into whether it makes any difference whether we call our child eczema or dermatitis, and it does not make much difference as long as we do not forget that we have no objective criterion by which we can tell them apart.

Dr. Walter J. Highman, New York: I rather imagined that the discussion of this paper would resolve itself into a debate as to which word should be abandoned. That does not interest me much. I think eczema is a silly word. We might discard it and we might discard the word dermatitis and talk of "eczema venenata" and so on. I think I brought out that possibility. We might classify these diseases into eczema of known and unknown origin. It makes no difference. Personally I prefer "dermatitis" despite the fact that Dr. Schamberg brought out that all the inflammatory diseases of the skin can be classed under this head. We could well apply "dermatitis of unknown or indeterminate origin" to many of the matters referred to by Dr. Fordyce. What the discussion has resolved itself into is that there are two diseases which represent the same clinical entity, in one of which we recognize the cause and in the other we do not. The problem in teaching students that Dr. Fordyce touched on is not to make it easy for students. We do not wish to give them sugar coated pills. We want to give them medical facts—why not let them exercise their brains? They would be glad to if it were allowed. There is nothing to be gained by predigestion.

I was stimulated in my work by Dr. Pusey himself and by a passage in his book, but it seems to me that the toryism with which Dr. Williams reviewed my contribution is precisely the point to be attacked. He says "here is a thing of unknown origin, we will call it eczema." As long as we persist in so doing

we will have the same confusion not only in our minds but in the minds of our students. When the patient wonders what he has and it happens to be eczema, or "exeema," and I tell them it is dermatitis they say, "What is it?" and I reply "An inflammation of the skin." I have never yet lost a patient by telling a simplified clinical fact to them. I do not think they question us in our ignorance. I think they realize that there are no absolute facts at our command, and that we are all striving for truth through our uncertainty. What I see as truth may be wrong, and I am willing to capitulate at a moment's notice if I have reason to change my mind, but I do not now think that my point of view is wrong, and I believe it is time for us to try to reclassify our conception of this condition according to the views expressed in my paper.

RESULTS IN THE TREATMENT OF CONGENITAL SYPHILIS*

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It is agreed by clinicians generally that there has been a marked reduction in the number of active cases of congenital syphilis compared with those of former years. This undoubtedly is attributable to the efficient prophylactic measures carried out today in the majority of the large maternity hospitals. The systematic application of the Wassermann test in obstetric clinics has rendered invaluable aid in uncovering many cases of unsuspected infection, and the employment of proper treatment during pregnancy has shown that a healthy child may be born of a properly treated syphilitic mother.

Through our association with the Sloane Hospital and the kind cooperation of Dr. Studdiford and his staff, we have had the opportunity of following a large number of children whose mothers were referred to us for treatment. In a certain percentage of these cases we have had the results of the Wassermann test on the blood from the umbilical cord, and have learned to be guarded in our opinion on the findings obtained at this time. A longer period of observation has shown that a positive Wassermann reaction at the time of delivery is not always evidence of syphilis in the infant, nor is a negative test an indication that the child has escaped the infection. In the absence of clinical signs of the disease greater reliance should be placed on routine tests taken a week or ten days after birth, and thereafter every four weeks up to the age of 6 months. The interval may be lengthened to three months until the infant is 2 years old, after which time an effort should be made to keep the child under observation for semi-annual examinations for an indefinite period. If, at the end of two years the child has continued to have negative reactions in the blood and the spinal fluid, and is negative clinically, in all probability it is free from syphilis.

DIAGNOSIS OF SYPHILIS

Occasionally we see infants with active syphilis and a negative blood reaction during the first few weeks which subsequently becomes positive under treatment. Clinical evidence must, of course, take precedence over laboratory findings, but such cases emphasize the importance of

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frequent examinations during the early months of life, for children born apparently healthy and with a negative blood reaction may later develop skin or other lesions and a positive blood reaction. The following is an illustrative case.

Mrs. M. D., aged 25, white, the mother of a healthy 3 year old child, came to the Clinic in July, 1921, with a generalized secondary maculopapular eruption of about three weeks' duration and a strongly positive blood reaction. A chancre was not demonstrable, but her husband was under treatment for a recent syphilitic infection. She was in the sixth month of gestation and up to the time of her delivery received eight injections of neo-arsphenamin intravenously and mercury by mouth. The blood had now become negative. On Nov. 3, 1921, she gave birth to full-term twins, who appeared healthy. The Wassermann reaction on the blood from the umbilical cord in both was reported three plus with the alcoholic antigen (icebox fixation) and one plus with the cholesterinized antigen. On November 15, blood from the forearm in both children was one plus with the alcoholic antigen (icebox fixation) and negative with the cholesterinized antigen. On December 5, they were brought to the Clinic. Careful inspection failed to reveal any lesions of the cutaneous surfaces or the mucous membranes; the spleen and liver were not enlarged; both infants were fairly well-nourished and specimens of blood taken on that day were reported negative with all methods. The mother was instructed to return in four weeks. On Jan. 9, 1922, all tests were again negative, and there was no clinical evidence of syphilis. At the next visit, Feb. 6, 1922, one of the infants (Baby A) presented a generalized papulosquamous eruption of six days' duration, distinct snuffles, and the typical facies of a syphilitic infant. It had been ill for about a week; the Wassermann test was now four plus. The twin (Baby B) was normal in weight, seemed perfectly well, and careful examination failed to disclose any evidence of the disease; its blood was also negative. Clinical and serologic examinations were repeated at first every week and then at longer intervals for seventeen months, during which time both continued negative. Unfortunately, the child then developed mastoiditis and died in the hospital shortly after. Baby A was actively treated, responded rapidly clinically and became serologically negative. At the age of eighteen months it fell ill with pneumonia and succumbed after a few days to the acute infection.

The pathologic report on the placentae of these twins is of interest. The examination made by Dr. Pierson of the Sloane Hospital staff showed that the placenta of Baby A (the syphilitic one) was abnormal, the villi in some areas being large, more cellular and less vascular than normal, findings suspicious of syphilis. The placenta of Baby B, who remained free from symptoms, was normal both macroscopically and microscopically. It is to be regretted that this child could not have remained under clinical observation for a longer interval or that necropsy was not performed to rule out definitely the presence of syphilitic foci in the viscera.

PRENATAL TREATMENT

The problem of prenatal treatment is not always a simple one. Many referred prospective mothers do not apply for treatment until the latter months of gestation, when great care must be exercised in the use of our drugs. For treatment to be successful it must be

begun early and should be continued throughout pregnancy, with proper rest intervals. But a most carefully developed and usually successful plan may be interfered with by complicating factors, such as the toxemia of pregnancy, intolerance to treatment, neurosyphilis, etc., which oblige us to render a more conservative prognosis. As an example of therapeutic failure we give in detail the history of Baby G., whose mother was both drug intolerant and neurosyphilitic.

Mr. G., aged 26, had had a chancre of the tongue in November, 1918, and had infected his wife several weeks later. He was intensively treated for two years. Since November, 1919, he had had a continuously negative Wassermann reaction and negative spinal fluid. His wife, aged 23, weighing about 110 pounds (49.8 kg.) was put on intensive treatment when secondary symptoms appeared and received from her physician during the succeeding ten months four injections of neo-arsphenamin, dosage 0.75 to 0.9 gm., two injections of arsphenamin, 0.4 and 0.6 gm., respectively, fourteen injections of mercuric salicylate and inunctions. Following the administration of the arsenicals she had severe reactions and after one of the injections an intense dermatitis which lasted several months, during which time all treatment was omitted. The following year, 1920, she received seven injections of neo-arsphenamin, 0.45 gm., and twenty-six injections of mercury. Urticarial manifestations and gastro-intestinal symptoms after intravenous administration and a febrile rise and gastric upset after mercury often interrupted the treatment. Her Wassermann reaction fluctuated from negative to positive. A spinal fluid examination in January, 1921, showed: cells, 1; globulin, a trace; Wassermann ++++ with 1 c.c., +++ with 0.8 c.c.; colloidal gold test, 1123210000. At about this time she became pregnant, and more treatment was advised, but on account of her former severe reactions, it was impossible to treat her actively. During the entire period of gestation, therefore, she received only six injections of silver arsphenamin, 0.1 gm., thirteen injections of mercury, and mixed treatment. In September, 1921, she was delivered of a male child weighing 9½ pounds (4.3 kg.), and reported normal. The Wassermann reaction on the blood from the umbilical cord was negative. The placental examination, made by Dr. Johnson, pathologist to the Sloane Hospital, was as follows: weight, 670 gm.; dimensions 15 by 16 by 2.66 cm. On section, the cut surfaces appeared normal; the fetal membranes were rather thick; the umbilical cord normal. Microscopic examination showed some of the chorionic villi more cellular and less vascular than normal, and the epithelium covering the villi rather thick. In one section adjacent to a clot on the maternal surface, the chorion and decidua showed large areas of necrosis and leukocytic infiltration; otherwise the fetal membranes were normal; the cord was normal. Dr. Johnson gave the opinion that these changes were suggestive of syphilis, but not definite enough to warrant a positive diagnosis. A blood Wassermann test made when the infant was 2 weeks old was negative. The child developed normally until the age of 3 months, when several large papules appeared on the buttocks, and the Wassermann reaction now was strongly positive. The child was well nourished and showed no other signs of syphilis.

Wider experience in the treatment of syphilis in pregnant women has led us to adopt a more conservative attitude as to the infection of the child. In the case cited an apparently normal child was born. The

placenta showed no definite pathologic evidence of syphilis. Treatment of the mother had modified but had not cured her syphilis. When definite syphilitic changes are present in the placenta, it must be taken for granted that the child, although free from signs of the disease at birth, may develop them after the first few months. The final opinion as to the infection of a child born of a syphilitic mother, even though her treatment has been thorough and has covered her entire pregnancy, cannot be definite until a time limit, at present unknown, has expired. An attenuation of the virus by treatment always modifies the infection and may delay clinical signs for months or years. A persistent negative Wassermann reaction in the child is the surest criterion of cure.

TREATMENT OF CONGENITAL SYPHILIS

About three years ago, we formulated a plan of treatment for congenital syphilis which on account of its simplicity could be carried out by the average physician provided minor technical details, such as location of injection, size and character of the needle and type of drug employed were observed. We also ventured the opinion at that time that systematic treatment begun early, namely, in the first week or two when possible, would probably result in the clinical and serologic cure in a large percentage of these cases. Intramuscular medication was advised because of the slow absorption and elimination of the drug and the negligible reactions and complications which follow this method, as compared with the severe one when the intravenous route is employed.

We have now given several thousand injections of neo-arsphenamin and mercury intramuscularly, with the development in only three or four instances of small abscesses, which healed rapidly after incision and evacuation of the pus from the broken-down tissue. Whenever this occurs we feel that there has been some error in the technic on the part of the operator or that the preparations used were faulty.

In carrying out the treatment it is important to watch the weight and development of the child, the digestive and excretory organs, and to increase, decrease or interrupt the treatment as indications arise.

We encounter in our clinical work different types of congenital syphilis dependent on the severity or latency of the infection which we group roughly as follows:

1. Asymptomatic cases with a strongly positive Wassermann reaction at birth or shortly after.

2. Active syphilis at birth with skin and mucous membrane manifestations, snuffles, visceral involvement, a low physical state and usually a positive Wassermann reaction.

3. Babies born apparently healthy and continuing so until the age of 3, 4 or 5 months, when they develop epiphysitis, cutaneous or visceral lesions, or a rapid loss in weight may be the only symptom for which the mother seeks medical advice. In these cases there have usually been no antepartum or postpartum serologic investigations, because the women were delivered by midwives.

4. Infants controlled by the Wassermann reaction which remains negative for the first two or three months and is then followed by the occurrence of clinical and serologic evidence of the disease.

5. A group of older children who present the familiar late manifestations of congenital syphilis, such as interstitial keratitis, dactylitis, periostitis, joint involvement, gummas of the cutaneous or mucous membrane surfaces or neurosyphilis.

The asymptomatic cases, as one would expect, offer the fewest difficulties in treatment. As a rule, these children are well developed, have a good musculature, tolerate the medication, and if treatment is carried out regularly, give gratifying serologic results.

The majority of patients with active syphilis with the usual early manifestations respond quickly to intramuscular treatment instituted shortly after birth, as outlined in a previous communication. The clinical symptoms disappear, a steady gain in weight takes place and within a few weeks the infant's appearance has undergone such a change that it is often unrecognizable. There are, however, cases in which the initial toxemia is so intense that the child is practically in a moribund state when first seen and usually succumbs to the infection in a few days or weeks. Owing to the under-development, poor musculature and reduced resistance, only very small doses of the drugs can be administered, and an unfavorable prognosis is generally given at the outset. However, in three instances in which a hopeless prognosis had been given, the infants to our astonishment showed a decided improvement after a few weeks' treatment. This continued during the succeeding months, and they are now on our list of children with negative reactions.

In infants who are not seen until clinical symptoms develop in the third to sixth month, treatment is usually successful unless there is severe visceral involvement, a rapid decline in weight and gastro-intestinal symptoms which interfere with feeding. Such cases often terminate fatally as the result of the infection or intercurrent disease. Reference should be made to the behavior of the Wassermann reaction which in some of these severe infections fluctuates from negative to positive and vice versa on repeated testing. Often the physician seeing the patient during the negative phase is misled and treatment is delayed for months, as in the case of Baby H., who was born apparently healthy, and developed jaundice at the age of 3 months. Both liver and spleen

were enlarged. Syphilis was suspected, but a negative serologic examination reversed this tentative clinical diagnosis. The attack cleared up without treatment, but when the child was 6 months old it had a similar one with considerable loss of weight. A Wassermann test made at this time was positive. Mercurial inunctions were ordered, the jaundice disappeared, but the general condition showed little change. At the age of 9 months a third attack occurred, and it was at this time that the child was seen by us. Injections of mercury were given at weekly intervals and after the fifth one, two intramuscular injections of neo-arsphenamin. An improvement in the general health of the child was noted, but the jaundice did not disappear entirely, and at the age of 11 months death occurred, the cause of which was obscure clinically. Necropsy was not performed, so that a definite diagnosis was not possible. This case illustrates three points: (1) the possibility of an alternating Wassermann reaction in severe syphilitic infections which may interfere with the interpretation of the clinical findings; (2) the difficulties encountered in treating neglected cases; (3) the unsatisfactory results in treating visceral syphilis in patients with a markedly lowered physical condition.

In children born well developed, well nourished and apparently free from syphilis until the third or fourth month, when clinical or serologic signs appear, the infection is often of a benign character and does not affect the general physical condition. The first symptom may be a limited eruption or a pseudoparalysis, the result of an epiphysitis, as in Baby Z., 10 months old, brought to the clinic by its mother, who said that for two weeks her baby's arms and legs had been paralyzed. Roentgen-ray examination showed an epiphysitis in both humeri and one femur. The child was of normal weight and appeared healthy, although it had a strongly positive Wassermann reaction. There was no history of syphilis in the parents. The mother on examination was found to have a four plus Wassermann reaction. After the fifth injection of mercury some mobility of the extremities was noted, and after several months of treatment motion was practically normal.

Less than 1 per cent. of all patients with eye trouble are said to suffer from interstitial keratitis. It has been estimated that it affects the female sex more often than the male in the proportion of 52 per cent. to 48 per cent., and that more than half the cases occur between the ages of 8 and 14. Our records show that our youngest patient was 1 year old and the oldest patients 21, 25 and 33 years of age, respectively, when the first attack occurred. The condition in the young is not infrequently associated with bone, joint, skin or mucous membrane manifestations.

The observation of interstitial keratitis supports the contention that spirochetes may remain localized in one tissue or one organ for a period of years without exciting an inflammatory reaction. The response to treatment is slow, and relapses sometimes occur. An important point to emphasize is the necessity for the persistence of treatment until the Wassermann reaction becomes negative.

The detection of involvement of the central nervous system in congenital syphilis, unless there are gross objective findings, is difficult in infants under 1 year. As they grow older the problem is simpler because of the greater ease in making eye and neurologic examinations. Lumbar puncture in the very young is an easy procedure technically, but bloody fluids are so frequent that it often necessitates renewed attempts on different occasions before a clear spinal fluid is obtained. Greater success is met with in children over 1 year.

The following history is instructive because of the presence of conjugal and familial neurosyphilis.

Mr. W., aged 35, had cerebrospinal syphilis. The date of the infection was unknown. He presented unequal, irregular pupils; hyperactive reflexes, more so on the right side; blood test, 4+; spinal fluid: cells, 25; globulin, +; Wassermann reaction, 4+ with 2 c.c. of fluid; colloidal gold test, luetic curve. His wife, aged 32, had no history or signs of syphilis until she gave birth to a syphilitic child, when the Wassermann test of the blood was found to be 4+. Examination five years later showed Argyll Robertson pupils and active and unequal deep reflexes; Wassermann test of the blood, 4+; spinal fluid, cells, 2; trace of globulin; Wassermann reaction, 4+ to 1.5 c.c. of fluid; colloidal gold test, luetic curve.

Her oldest child, P., had had a syphilitic eruption at the age of 3 months; a left hemiplegia at the age of 18 months, and epileptiform attacks at the age of 4 years, up to which time the mother stated the child was of average mental development. When first seen at 5 years of age, she had unequal pupils, almost fixed to light; increased knee and ankle jerks on the left side, with Babinski, Chaddock and clonus reflexes; hemiplegic gait; marked speech disturbance and mental retardation. She was subject to violent outbursts of temper and was difficult to manage. For one year she suffered from frequent convulsive seizures. The Wassermann test of the blood was 4+; spinal fluid: cells, 140; globulin, 4+; Wassermann test, 4+ to 0.2 c.c. of fluid; colloidal gold test, paretic curve.

The second child, W., was born healthy, was bright and appeared normal in every way. When seen at the age of 2½ years, he had unequal pupils; otherwise there was no physical abnormality; the Wassermann test of the blood was 4+; spinal fluid: cells, 12; globulin, negative; Wassermann test, 4+ with 2 c.c. of fluid; colloidal gold test, luetic curve.

Syphilis of the nervous system has long periods of latency in the child as well as in the adult. The usual time for the development of juvenile paresis is from ten to fifteen years, although earlier as well as later cases are encountered. It is fair to assume that in these children the infection was present at birth. We have enough positive evidence to support this statement. The degenerative changes in the central

nervous system are held in abeyance by the defensive forces of the body, the latency of the infection or treatment, as illustrated in this case:

A., a girl, now aged 13, was born with syphilitic manifestations and treated with inunctions for five years. When 9 years old she developed tremor and a spastic gait. When she came under observation at the age of 11, her pupils were dilated, unequal and fixed to light; all the deep reflexes were active; she had a bilateral Babinski sign and ankle clonus; her gait was spastic. She was moody, irritable and difficult to control; there was disturbance of speech, and she was retarded mentally about two years. Her Wassermann test was 4+; spinal fluid: cells, 87; globulin, 4+; Wassermann test, 4+ to 0.1 c.c. of fluid; colloidal gold test, paretic curve. Intravenous and intraspinal injections were given over a period of two years. She made a decided improvement mentally, which was evident to her parents and teachers; she was able to concentrate better and showed greater interest in her studies. Her spasticity had increased somewhat. Her spinal fluid showed only 6 cells per c.mm.; otherwise, the findings were the same as two years ago. The blood was still strongly positive.

STATISTICAL STUDY

During the past three years, 612 children were admitted to the department of syphilis at the Vanderbilt Clinic. Classified according to the presence or absence of syphilis, they fall into Group A, showing positive findings, and Group B, showing negative findings of the disease.

Group A comprised 203 children, the majority of whose mothers had received insufficient, indifferent or no treatment. There were 115 females and eighty-eight males; 126 were white and seventy-seven were black. Their ages ranged as follows: seventy-one patients from 2 weeks to 6 months old; seven patients from 6 months to 1 year; eleven patients from 1 to 2 years; twenty-one patients from 2 to 3 years; ninety-two patients over 3 years.

The Wassermann reaction on the blood from the umbilical cord was reported in twenty-four infants as follows: strongly positive in seventeen; weakly positive in two and negative in one, with all methods; strongly positive with the alcoholic antigen (icebox fixation) (alone) in two and weakly positive in two.

The Wassermann reaction on admission was ++++ in 169; +++ in seven; ++ in twelve; + in two and negative in thirteen, of which eleven became positive later.

Cutaneous or other lesions indicative of syphilis were present in forty-nine cases.

In 147 there were no obvious manifestations. We feel certain that in many of these cases there was probably visceral involvement, and that our clinical methods of examination failed to detect it because the pathologic changes were of a mild grade.

Treatment.—Fifty-five patients received two or more courses of neo-arsphenamin and mercury intramuscularly; seventy-three received

less then two courses of these drugs; eleven of the older children received several courses of arsphenamin intravenously and mercury intramuscularly; sixty-five received no treatment due either to removal, failure to return, or death of the child. Our records show that twenty-eight infants and one child of 8 years died of syphilis or intercurrent disease.

Serologic Results.—Of the fifty-five patients who had received two or more courses of treatment, the reactions of thirty became negative and of twenty-five remained positive; the majority of these were young infants in whom treatment was begun early and followed systematically. Of the seventy-three who received less than two courses, the reactions of twenty-two became negative and of fifty-one remained positive. Of the seventy-six positives in both groups, five were reduced to doubtful; one to +; two to + +; fourteen to + + +; twenty-four fluctuated from positive to negative and vice versa under irregular treatment, and thirty remained + + + +. The group remaining strongly positive includes the majority of our older children, that is those from 3 to 11 years old. Our experience shows that it requires persistent systematic treatment to reverse the Wassermann test to negative in these cases.

Group B included 408 children born of mothers who had a positive Wassermann reaction during pregnancy; there were 211 males and 197 females; 220 were white and 188 black. Their ages on admission were as follows: 185 patients from 2 weeks to 6 months old; forty-two patients from 6 months to 1 year; forty-eight patients from 1 to 2 years; twenty-two patients from 2 to 3 years, 111 patients over 3 years.

Prenatal treatment had been administered at the Vanderbilt Clinic to 106 mothers; the remainder were treated privately, in other clinics, or had received no treatment.

We have under observation a group of forty women in whom the Wassermann reaction was weakly or strongly positive antepartum but which gradually became negative after delivery, in fourteen without any treatment whatever and in twenty-six with so small an amount of treatment that under ordinary circumstances it would have no effect on the Wassermann reaction. These women all gave birth to infants which have remained healthy both from a clinical and laboratory standpoint.

The Wassermann reaction at the time of delivery was reported in thirty-three infants as follows: negative in two; + + + + in fourteen; + + + in three; + + in three; and + in one, with all methods. In ten cases there was a one to three plus reaction with either the alcoholic or the cholesterinized antigen alone.

At the time of admission the Wassermann reaction was negative in the entire group. Quite a number of these children have disappeared from observation; but of those we have been able to follow over a period

of from six months to three years, the Wassermann reaction has continued negative and no clinical manifestations have made their appearance.

Lumbar puncture was performed on 128 children, sixty-one male and sixty-seven female, of whom fifty-six were black and seventy-two white. Their ages ranged in thirty-one cases from 1 to 6 months; forty cases, 6 months to a year; thirty-two cases, 1 to 2 years and twenty-five cases, from 2 to 11 years. Seventy-four patients were negative clinically and serologically; fifty-four had positive evidence of syphilis. The results were as follows: 114 cerebrospinal fluids were normal; nine were strongly positive and five weakly positive. The positive fluids all occurred in white children. Clinical evidence of neurosyphilis was present in nine children whose ages ranged from 2 to 11 years; no gross objective signs of involvement of the central nervous system were found in children under 1 year. Of the latter, four infants, aged 4 months, 8 months, 11 months and 12 months, respectively, had strongly positive cerebrospinal fluids, and one aged 8 months had a weakly positive fluid.

SUMMARY

1. The success of prenatal treatment depends on (1) the duration of the infection, (2) early administration of treatment, and (3) the amount tolerated.

2. Negative clinical and serologic findings at birth are not always indicative of the absence of syphilis. It is advised that routine examinations be made at monthly intervals for the first six months and then every three months for the first two years.

3. Microscopic examination of the placenta may prove of greater value in determining a latent infection than the result of the Wassermann reaction on the blood from the umbilical cord or from the veins during the early months of life.

4. Occasionally cases of active syphilis with a negative serology are seen. Clinical manifestations must always take precedence over laboratory findings.

5. Of 128 treated patients with active syphilis, fifty-five had received two courses or more of neo-arsphenamin and mercury intramuscularly; of whom thirty patients, or slightly more than 53 per cent., became negative clinically and serologically, the observation period now extending over two years in some instances. The remaining seventy-three cases consist of two groups—one made up of younger infants, of whom twenty-two, or 30 per cent., became negative with less than two courses of injections given regularly, and the other made up of older chilren who had received less than two courses of treatment scattered over irregular intervals and who had remained positive.

6. Lumbar puncture was performed on 128 children, with negative results in 114 and positive in fourteen. In the negative group, seventy-four children were negative clinically and serologically, while the remainder, forty, had a strongly positive Wassermann reaction; the positive group had either a positive blood or clinical signs of the disease. In a total of fifty-four syphilitic children, therefore, fourteen cases of neurosyphilis or about 25 per cent. were found, approximately the same proportion as in adults. From the occurrence of a positive fluid in the early months of life, the inference is that infection of the central nervous system takes place early in the disease, as in the acquired form. In all probability certain mild types tend to disappear spontaneously or under treatment. When the more severe forms are present, the same difficulties in treatment are encountered as in adults.

7. The prognosis of congenital syphilis depends on: (1) the amount of prenatal treatment; (2) the physical condition at birth; (3) the severity of the infection, whether visceral, cutaneous or neural involvement is present; (4) the time treatment is begun; (5) the type of treatment, and (6) the toleration to treatment.

DISCUSSION

Dr. Udo J. Wile, Ann Arbor: I think the experience of Drs. Fordyce and Rosen with this extremely intractible type of syphilis is instructive for those of us who in the past have despaired of doing very much for children in whom the syphilis is really bred in, so to speak, during their development. I have been much discouraged in the treatment of the congenital type of syphilis as we see the cases here. To be sure, the children respond readily to the symptoms present, but in the type of cases we have seen we have never been able to rid the patients of their biologic reaction. The thing I am interested in is this: Dr. Fordyce and Dr. Rosen have shown that it is possible for a thoroughly syphilized child to give a negative reaction; the mother's reaction may also be negative. The question in my mind is whether our criteria are sufficiently rigid to say that these children are cured, even though the Wassermann reaction is negative. I cannot quite convince myself of that.

Dr. Oliver S. Ormsby, Chicago: Since the article of Dr. Fordyce and Dr. Rosen came out two or three years ago, we have limited our treatment in these cases to their method. I cannot give statistics, but our results have apparently been better than with any treatment we have used before. I feel that with the adoption of this method there will be a greater number of recoveries than with any previously used. I have always thought that arsphenamin was more efficient when given intramuscularly than when administered intravenously when untoward results did not occur, and with these infants we have seen no untoward results follow the intramuscular injections. I believe it is the method of choice at present.

Dr. Harold N. Cole, Cleveland: My experience has been very much like Dr. Ormsby's. Since taking up this method we have been very much pleased with it, and the instances in which we have had trouble with the intramuscular injections have been few and far between—I think in only one child. In this instance, several children were being treated on the same day, and this particular

one developed a necrosis. We thought this was an infection or a coincidence. After this cleared up, we again gave an injection in the other buttock, and the child again developed a necrosis. This is the only unfavorable result that I recall.

The treatment of congenital syphilis, when it can be carried out by this method, no longer has the terrors it formerly possessed.

Dr. J. Frank Schamberg, Philadelphia: I think we as dermatologists should interest ourselves more in congenital syphilis than we have in the past. We have been accustomed, from the work of Fournier and other early dermato-syphilologists, to base our diagnosis on some of the stigmas—hutchinsonian teeth, cutaneous eruptions and so on, but I believe there are many subtler manifestations that often escape our attention. A pediatrician made the statement that one of the symptoms is a "constitutional inferiority." I think young children, born of syphilitic parents, whether the Wassermann reaction be negative or not, if they have a persistent subnormality of weight, should be subjects of suspicion and should be examined with the greatest amount of thoroughness; and if they do not respond to general measures of treatment, they should be subjected to antisyphilitic treatment. I think our treatment in such cases should not be too vigorous. Children with congenital syphilis may present symptoms at birth or may show secondary or tertiary symptoms later: they may, on the other hand, never show any definite manifestations of the disease. We may see half a dozen children in the same family, all with positive Wassermann reactions and occasionally an intermediate child with a negative reaction. I cannot but believe that the negative in such a case is a false negative. I believe with Dr. Wile that our criteria for the judgment of syphilis are still imperfect. We know that with the Wassermann and allied tests we have proceeded from the grosser to the more delicate ones.

With the Kolmer test we have had about 20 per cent. more positives than with the old three antigen method. We have recently been employing sulpharsphenamin in the treatment of congenital cases. It has two advantages, I think, over neo-arsphenamin. It is less painful than neo-arsphenamin, and it is better tolerated by the muscular tissues and thus less apt to lead to inflammatory tumefaction. I believe it will supplant neo-arsphenamin for intramuscular use.

The whole subject of congenital syphilis is deserving of our most careful study, for I believe that there are tens of thousands of children who harbor living spirochetes, but who have never manifested any lesion characteristic of the disease. A persistently negative Wassermann reaction in children of syphilitic parents is, in my opinion, not sufficient evidence of the absence of the disease.

Many of these subjects are below par in many ways, but there has been such an adaptation of parasite to host that the former live almost but not quite a saprophytic existence. In children of syphilitic parentage exhibiting constitutional inferiority even though the Wassermann test is negative, antisyphilitic treatment is, in my opinion, indicated.

Dr. John A. Fordyce, New York: There are so many problems in connection with this subject that it is difficult to discuss them in so short a time. The treatment, it seems to me, is much more effective than that previously carried out. The lesions disappear, the children gain in weight, and in quite a percentage of cases we have obtained negative Wassermann reactions. How

much that is worth, we do not know at this time. The method has met with considerable favor in New York and has been recommended by the state health department at Albany. In my opinion it accomplishes more than any other procedure employed. Whether the patients will remain "cured," is still to be seen. In some of the older children with positive Wassermann reactions, we find that by persisting in treatment over two or three years eventually a negative Wassermann reaction is obtained. When this occurs it seldom becomes positive again, so in spite of the claims made by pediatricians that it is impossible to change a positive Wassermann reaction in congenital syphilis we find that we can, by persisting in treatment, reverse it to negative.

A STUDY OF SOME OF THE INORGANIC SALTS IN THE BLOOD IN PSORIASIS AND IN CERTAIN OTHER DERMATOSES *

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For some years, we have been engaged in studying the etiologic factors in psoriasis. As no data have been hitherto published on the more important inorganic salt content of the blood in this condition, we thought this worthy of investigation. We examined the blood of patients with psoriasis for calcium, magnesium, potassium and phosphorus. The amounts determined all fall within normal limits. We likewise analyzed the blood in some cases of eczema, urticaria and several other dermatoses. The findings in these cases were likewise normal.

In a previous communication [1] in which the more important non-protein nitrogenous bodies of the blood were studied, the data presented indicated an unusual incidence of hyperuricemia in many cases of eczema and pruritus.

The literature on the subject of inorganic salts in the blood diseases of the skin is quite meager. Levin and Kahn [2] reported a few calcium determinations in various skin diseases. All their figures were normal. Pulay [3] found some variations in the calcium content of the blood in various dermatoses and suggested that the colloidal aspect of the question is of great importance and that much may depend on the calcium content of the tissues. His figures have since been questioned on account of conclusions drawn from too small a series of cases.

Thro and Ehn [4] stated that there is an increase in calcium in patients with acne, while those with boils had a decreased blood calcium. Later [5] the same investigators found a low blood calcium in four patients with furunculosis. In the latter paper the authors state that the method employed for calcium determination in studying acne was perhaps open to doubt.

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* From the Research Institute of Cutaneous Diseases.

1. Schamberg, J. F., and Brown, H.: The Relationship of Excess of Uric Acid in the Blood to Eczema and Allied Dermatoses Based on an Analysis of Over Two Hundred Cases, Arch. Int. Med. **32**:203 (Aug.) 1923.
2. Levin, L., and Kahn, M.D.: Am. J. M. Sc. **162**:698, 1921.
3. Pulay, E.: Dermat. Wchnschr. **76**:81, 1923.
4. Thro, W. C., and Ehn, M.: Proc. Soc. Exper. Biol. & Med. **17**:115, 1920.
5. Thro, W. C., and Ehn, M.: Proc. Soc. Exper. Biol. & Med. **18**:189, 1921.

TABLE 1.—*Normal Values of Inorganic Constituents Given by Various Authors for Human Blood Serum* *

Calcium	Magnesium	Phosphorus	Potassium	Authority
.....	2.2-3.5	.....	.....	Marriott, W. McK., and Howland, J.: J. Biol. Chem. **32**: 233, 1917
.....	.....	1.8-4.3	.....	Bloor, W. R.: J. Biol. Chem. **36**: 49, 1918
9-12	.....	.....	.....	Howland, J., and Kramer, B.: Am. J. Dis. Child. **22**: 105, 1921
9.3-10.0	2.3-4.0	.....	19.5	Kramer, B., and Tisdall, F. F.: J. Biol. Chem. **53**: 241, 1922
10.0	2.0-4.0	3.0	20.5	Denis, W., and Hobson, S.: J. Biol. Chem. **55**: 183, 1923
9.2-10.6	1.9-2.7	.....	.....	Bogert, J. L., and Plass, E. D.: J. Biol. Chem. **56**: 297, 1923

* The values given by the earlier investigators such as Schmidt (Charakteristik der epidemischen Cholera, gegenüber verwanden Transsudationsanamallen: eine physiologisch-chemische Untersuche, Leipsic and Mitau **29**: 32, 1850), Bunge (Ztschr. f. Biol. **22**: 191, 1876), Wanach (Jahresb. Thierchem **18**: 88, 1888), and Abderhalden (Ztschr. Physiol. Chem. **25**: 65, 1898), to whom we owe our first data on the inorganic blood constituents, are not included in the foregoing list since the methods used by them were not as refined as those used at present, and therefore their results are not comparable.

TABLE 2.—*Blood Findings in Twenty-Four Cases*

No.	Name	Age	Sex	Weight, Kg.	Diagnosis	Calcium	Magnesium	Phosphorus	Potassium	Comment
1	S. A.	39	M	55.5	Urticaria	14.0	...	...	....	
2	R.	54	F	....	Urticaria	9.8	...	...	....	
3	J. C.	39	M	....	Psoriasis	9.3	2.6	2.7	20.0	
4	F.	22	F	60.5	Generalized psoriasis	11.1	2.1	3.0	20.6	10 years
5	K. K.	57	M	....	Psoriasis	10.0	2.4	2.8	24.0	
6	K. W.	32	F	56.8	Psoriasis	9.0	3.0	2.8	17.1	7 years
7	P.	..	M	....	Urticaria	10.7	3.1	3.1	19.0	
8	H.	33	F	....	Urticaria chronica	9.0	3.0	2.9	20.6	
9	J. L. H.	62	M	....	Eczema	8.8	3.0	2.8	18.1	
10	S.	54	M	....	Psoriasis	11.0	2.7	3.1	20.7	
11	F. R. S.	34	M	71.8	Psoriasis	10.0	3.8	2.4	22.0	20 years
12	H.	..	M	....	Psoriasis	10.7	3.3	2.8	18.0	
13	B.	55	F	....	Psoriasis	11.3	2.8	2.8	18.9	
14	J. DeR.	..	M	....	Prurigo	10.7	2.8	3.4	17.2	
15	S. Z.	31	M	62.7	Urticaria chronica	12.7	2.3	3.2	21.7	
16	G. E. J.	20	M	....	Dermatitis herpetiformis	10.2	3.6	3.0	20.2	
17	S.	58	M	....	Psoriasis	10.2	3.0	3.3	21.6	
18	S.	43	M	....	Eczema	9.7	3.0	2.7	20.6	
19	J.	31	F	54.5	Generalized urticaria	10.3	2.5	2.6	23.0	11 months
20	H.	39	M	....	Eczema	10.7	2.8	2.6	22.2	
21	J. W.	40	M	98.6	Eczema	10.4	2.7	2.7	20.3	
22	I.	45	M	....	Psoriasis	10.9	2.8	3.0	19.9	
23	I. E. F.	26	M	55.5	Psoriasis	9.7	3.0	2.7	21.0	
24	C.	..	F	....	Psoriasis	10.0	2.6	3.0	20.1	

TABLE 3.—*Control Values on Normal Cases Studied by Us* *

Name	Blood Constituents, Mg. per 100 C.c. Serum			
	Calcium	Magnesium	Phosphorus	Potassium
C. R.	11.0	2.8	2.6	20.0
H. B.	10.8	2.5	2.6	19.5
A. R.	11.3	2.7	3.0	19.8
C. K.	10.2	2.4	2.8	18.9
B. F.	9.7	2.6	2.4	19.0
B.	10.0	2.3	2.7	18.5

* The subjects were laboratory workers in good health.

Briggs [6] in three cases of acne and one each of psoriasis and urticaria obtained strictly normal values for phosphorus, chlorin, sodium, potassium, calcium and magnesium of the blood plasma. He says, however, that no generalizations are possible in view of the small number of analyses. In the same paper, he lists results on about forty different pathologic plasmas and concludes that marked variations in the level of the inorganic elements of the blood are exceptional.

In the study of the causation of the diseases of undetermined origin, it is important to report negative as well as positive findings; not only does the recording of the former save future investigators from traversing the same sterile field, but the negativity of such results permits one to exclude such factors as possible etiologic agencies.

A matter of incidental interest relates to the calcium content of the blood in urticaria. For some years past calcium has been advised in the treatment of this condition, and good results have at times been alleged. The studies we have made, although too meager in number to be conclusive, would indicate that there is no deficiency of the calcium content of the blood in cases of urticaria. Indeed, the average of six cases gives a yield of 11.1 mg., whereas the average of seventeen other dermatoses shows 10.3 mg.

METHODS OF ANALYSIS

The following elements were determined: calcium, magnesium, inorganic phosphorus and potassium. (A few chlorin determinations were made, but since the results were of no significance and since whole blood was used, the figures are not included in this report.) All determinations were made on serum. Care was taken not to permit contact of serum with clot longer than two hours, since it has been shown [7] that longer standing will probably increase the serum content of potassium.

Calcium was determined by Clark's [8] method, magnesium according to Denis,[9] phosphorus by Briggs' modification [10] of Bell and Doisy's [11] method and potassium according to the scheme outlined by Kramer and Tisdall.[12]

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6. Briggs, A. P.: J. Biol. Chem. **57**:351, 1923.
7. Wilkins, L., and Kramer, B.: Studies on the Potassium Content of Human Serum, Arch. Int. Med. **31**:916 (June) 1923.
8. Clark, G. W.: J. Biol. Chem. **49**:487, 1921.
9. Denis, W. J.: J. Biol. Chem. **52**:411, 1922.
10. Briggs, J.: Biol. Chem. **53**:13, 1922.
11. Bell, R. D., and Doisy, E. A.: J. Biol. Chem. **44**:55, 1920.
12. Kramer, B., and Tisdall, F. F.: J. Biol. Chem. **46**:339, 1921.

Abstracts from Current Literature

ENDOTHERMY IN ACCESSIBLE MALIGNANCY AND PRECANCEROUS CONDITIONS. George A. Wyeth, Am. J. Electrotherap. & Radiol. **41**:145 (May) 1923.

By endothermy is meant the production of destructive heat in the tissues from within by the contact application of a high frequency current, either monopolar or bipolar. The success of this mode of treatment is attributed to the ability to produce a protective ring of destruction around a malignant area by coagulation necrosis, which shuts off and destroys the blood vessels and lymphatics to and from the affected part. The lesion is destroyed by dehydration, and the resulting slough removed by curettage or dissection.

REPORT OF A CASE OF ERYSIPELAS TREATED WITH REFLECTED INCANDESCENT LIGHT. F. T. Woodbury, Am. J. Electrotherap. & Radiol. **41**:247 (Aug.) 1923.

This is a case report. H. R. Foerster, Milwaukee.

THE PROGNOSIS OF SYPHILIS. J. A. Fordyce, Am. J. Med. Sc. **166**:313 (Sept.) 1923.

The syphilitic patient's future depends almost entirely on the knowledge of the physician first consulted, as dark-field examination and intensive treatment may not be used to establish an early diagnosis and begin abortive treatment.

Fordyce believes that patients with primary cases, if the Wassermann test is negative, can generally be assured a cure by intensive treatment, this consisting of two courses of eight arsphenamin and fifteen mercury injections each. After the Wassermann test has become positive, a cure is possible with thorough treatment long continued even though the Wassermann test becomes negative early. These cases may require intraspinal treatment and long observation before a cure can be pronounced.

Symptomatic cure can be obtained in tertiary and latent cases by several courses of arsphenamin with mercury and the iodids.

Neurosyphilis, especially in the degenerative stages of tabes and paresis, has not a favorable prognosis, although adequate treatment, including intraspinal, in the early stages will generally cure patients with early cases, while improper treatment in these cases may result in tabes or paresis.

The prognosis of congenital syphilis is less favorable than in the acquired form, this being especially true in the patient with neurosyphilis.

With regard to marriage, a negative Wassermann test and spinal fluid test for one or two years after adequate treatment had been given should be required before consent to marry is given, although in exceptional instances a positive Wassermann test may not prevent such consent.

The criteria of cure depend on adequate treatment, negative Wassermann tests for at least one year after cessation of all treatment, a negative spinal fluid and negative findings in the cardiovascular system.

CEREBROSPINAL FLUID PRESSURE: CONCERNING AN INITIAL FALL IN PRESSURE READINGS AND THE METHOD OF OBTAINING A STANDARD READING. H. C. Solomon, H. M. Pfeiffer and L. J. Thompson, Am. J. Med. Sc. **166**:341 (Sept.) 1923.

When lumbar punctures were performed with the patient lying tense and flexed on his side, the pressure was found to be much higher at first than after the lapse of ten minutes. A fairly rapid fall occurs soon after the insertion of the needle, which gradually becomes slower and reaches a stable equilibrium in about ten minutes in the majority of cases.

The factors influencing the rise and fall of pressure are the position and tension of the patient, apprehension, talking, coughing, etc.

STUDIES OF CEREBROSPINAL FLUID IN INFANTS AND YOUNG CHILDREN IN CONDITIONS OTHER THAN ACUTE MENINGITIS. S. McLean, Am. J. Med. Sc. **166**:350 (Sept.) 1923.

The results of lumbar punctures in respiratory, intestinal and neuropathic conditions are summarized, stating also that the fluid in congenital syphilis is clear and colorless and usually with normal pressure. Some evidence was found to indicate that there may be central nervous system involvement without pleocytosis.

INTESTINAL INDIGESTION IN ECZEMA AND PSORIASIS. F. L. Burnett, Am. J. Med. Sc. **166**:415 (Sept.) 1923.

Instead of the usual idea that intestinal absorption is too great for a slow peristaltic action and is thus the cause of many skin disorders, Burnett advances the opposite theory—that many patients have too rapid peristalsis, with a consequent lack of absorption of certain necessary products of digestion and a diminution of general nutrition.

He considers that the normal feces should consist of units instead of being soft and formless, and he determines the intestinal peristaltic rate by the administration of millet seed. Patients with formless stools have an initial rate of fourteen hours, which increases later to sixty-two hours, when feces of units are formed.

Intestinal indigestion is believed to be present when the feces are soft and formless, and he suggests dietary changes in which 100 gm. of protein, 100 gm. of fat and 200 gm. of carbohydrate and accessory substances would compose the proper amount and kind of food for one day. The different foods and general dietary regimen are carefully detailed, and summaries are given in which a number of patients with eczema and psoriasis are reported as well or improved under the changed dietetic conditions.

JUVENILE PARESIS: WITH A PRESENTATION OF TWENTY-THREE CASES. J. V. Klauder and H. C. Solomon, Am. J. Med. Sc. **166**:455 (Oct.) 1923.

In this series of cases it was found that the development of initial symptoms appeared at ages varying from 3 to 21, several years sometimes elapsing from the time of appearance until frank symptoms developed. In most cases there was either a positive Wassermann test in the mother or definite syphilitic symptoms in either parent, some having neurosyphilis. Wassermann tests performed on the brothers and sisters of the patients gave variable results.

Mental and physical evidence of paresis developed at various ages, epileptiform seizures, hemiplegia and optic atrophy being found in some of the cases. Trauma appeared to be the exciting cause in two cases. All but one had pupillary abnormalities.

The laboratory findings corresponded in general with those in paresis in adults.

JAMIESON, Detroit.

LUPUS WITH OCULAR EXTENSION. W. S. FRANKLIN and F. C. CORDES, Am. J. of Ophth. **6**:573 (July) 1923.

This is a case report with histologic findings and photomicrographs. The disease was caused by a secondary infection of the cornea from a pre-existing lupus vulgaris of the cheeks and nose.

H. R. FOERSTER, Milwaukee.

A NEW METHOD FOR ACCURATELY DETERMINING THE CLOTTING TIME OF THE BLOOD. M. F. PETERSON and C. A. MILLS, Arch. Int. Med. **32**:188 (Aug.) 1923.

This method is simple and requires a capillary pipet of 0.6 to 0.8 mm. inside diameter and 1¼ inches (3.1 cm.) long. The second drop of blood from a stab wound is allowed nearly to fill the pipet, after which the pipet is placed in one of the palmar creases and the hand closed. The tube should be gently inverted and observed every thirty seconds until clotting takes place. Accurate observations can be obtained by this method.

THE RELATIONSHIP OF EXCESS OF URIC ACID IN THE BLOOD TO ECZEMA AND ALLIED DERMATOSES, BASED ON AN ANALYSIS OF OVER TWO HUNDRED CASES. J. F. SCHAMBERG and H. BROWN. Arch. Int. Med. **32**:203 (Aug.) 1923.

In their study of 243 cases with regard to the uric acid content of the blood, the authors have drawn a number of interesting conclusions relative to weight, age and disease.

Over half of their patients had eczema, 50 per cent. of them showing an increase over the maximum normal (3.5 mg.). This was found to be true also in some cases of local and general pruritis. In younger patients with eczema the uric acid was not so great as in older patients, the curve rising between the ages of 40 and 70. In general, males had about 25 per cent. more uric acid than females.

They are inclined to believe that the cause of hyperuricemia is associated with renal dysfunction, many of their patients becoming more amenable to treatment when treated from this standpoint.

CLINICAL AND ROENTGENOLOGIC STUDY OF ONE HUNDRED AND FIVE CASES OF SYPHILIS WITH REFERENCE TO THE CARDIOVASCULAR SYSTEM. E. STEINFIELD, G. E. PFAHLER and J. V. KLAUDER, Arch. Int. Med. **32**:556 (Oct.) 1923.

With a review of the literature on this subject and a discussion of the pathology and symptoms of cardiovascular syphilis, the authors analyze their findings in a series of 105 cases. Twelve of the patients were found to have aortic or myocardial disease—one a case of aortitis, two aortic dilatation, six aortic dilatation and insufficiency and two of aneurysm. Practically all these patients had a four plus Wassermann reaction.

They found that syphilis apparently played no part in the common type of vascular hypertension, although a lowered pressure was found in nearly one third of their cases.

They advise treatment by means of inunctions or internal medication for six weeks before beginning more active treatment. Arsphenamin in small doses once or twice a week for from six to ten injections was given with benefit and should be followed by treatment with mercurial injections.

Roentgenograms showed that 28.5 per cent. of the patients had syphilitic aortitis and 4.7 per cent. had aneurysm. They also found one case of pulmonary syphilis, five probable cases, and normal lungs in forty-two cases.

JAMIESON, Detroit.

RAT BITE FEVER WITH SPECIAL REFERENCE TO ITS AETIOLOGICAL AGENT. M. J. PARMANAND, Indian J. M. Res. **11**:180 (July) 1923.

The author reports finding a spirochete similar to that of Futaki and Row in five cases of rat-bite fever. The cases clinically presented a local inflammatory process that developed from six to twenty days after the rate bite. This was accompanied by local pain, a febrile reaction and a more or less generalized macular eruption. The spirochetes varied in length from 1.5 to 5 microns. They were thicker than *Spirochaeta pallida* and averaged from two to three spirals. The ends were tapering, and there was a flagellum at each end. The organism was obtained in serum from the primary lesion either directly or after inoculation of white mice, identification being made by dark-field examination or by the use of the ordinary stains.

THE WASSERMANN REACTION IN LEPROSY. R. B. LLOYD and E. MUIR, Indian J. M. Res. **11**:229 (July) 1923.

1. In a series of 228 adult lepers they found a positive Wassermann reaction in 41.7 per cent. of all cases, in 27 per cent. of anesthetic cases, in 47.4 per cent. of mixed cases and in 63 per cent. of nodular cases.

2. In a series of fifty-eight leprous children, they found a positive Wassermann reaction in 62 per cent. of all cases, in 47 per cent. of anesthetic cases, in 80 per cent. of mixed cases and in 100 per cent. of nodular cases; i. e., very much higher figures than in adults.

3. A control of forty-six untainted children from the same community as (2) above, whose parents or guardians were lepers, showed no evidence of a higher positive Wassermann rate than can probably be accounted for by the average syphilis rate.

GUY, Pittsburgh.

RELATION OF PRURITUS OF ANUS TO CHRONIC DISEASES OF ABDOMINAL AND PELVIC VISCERA. J. F. MONTAGUE, J. A. M. A. **81**:1661 (Nov. 17) 1923.

The author excludes from this discussion pruritus ani due to local causes, and concerns himself only with anal pruritus associated with disease of the abdominal viscera.

Montague believes that anal pruritus secondary to abdominal disease is caused by a viscerosensory reflex analogous to that underlying the theory of the misreference of pain. The neural pathways involved are traced. The importance of thus differentiating the etiologic factors concerned in pruritus ani is apparent.

CLINICAL RESULTS WITH FLUMERIN IN SYPHILIS. J. E. Moore and H. Wassermann, J. A. M. A. **81**:1840 (Dec. 1) 1923.

Flumerin is a synthetic mercurial which possesses valuable properties, as shown by studies on rabbit syphilis. The present report embraces a seventeen month study of its effects on syphilitic patients in various stages of the disease. The average dose was 3 mg. per kilogram every second or third day.

In all cases reported on, except a special group, flumerin was the first treatment given; other syphilitic remedies being used only after a course of the drug had been administered.

In six cases of chancre, the lesion was healed after the administration of six doses in an average time of twenty-six days. In twenty-eight patients with secondary eruptions, the lesions disappeared in twenty-four instances, an average of six doses and seventeen days being necessary to obtain this result. In four cases the rash disappeared, but lesions of the mucous membrane persisted. The effect on the Wassermann reaction was good, paralleling that obtained with arsphenamin in the same length of time. Flumerin has a more decided effect on the Wassermann reaction than other mercurials.

Twenty-nine patients with tertiary syphilis were treated. In nineteen the lesions were healed, an average of eight doses being required. In five of these patients the Wassermann reaction was changed to a permanent negative, and in six it was reduced in strength.

In Wassermann positive latent syphilis, the effect on the test was not especially striking. Some reactions to the drug were observed, usually of a mild character, but in eight cases flumerin was abandoned because of severe reactions.

Thus, flumerin appears to be therapeutically active in the doses used. Its field of usefulness is the same as that of other mercurials, with the additional advantage of its higher therapeutic index.

The authors advise its employment complementary to arsphenamin, especially in early syphilis.

RESTRICTION OF RATE OF FLOW AND INTERCHANGE IN THE CAPILLARIES. B. Douglas, J. A. M. A. **81**:1937 (Dec. 8) 1923.

In rabbits, it was found that a dilute epinephrin-procain solution applied to denuded skin surfaces prevented the absorption of otherwise poisonous drugs. The protection afforded by this procedure is due to the restriction of the rate of flow and other by-effects on the superficial capillaries. The author is now engaged in investigating the value of the procedure in protecting human beings against absorption of toxic substances following extensive burns.

STUDIES IN THE INTRAVENOUS INJECTION OF URIC ACID IN ANIMALS. F. J. Schamberg and H. Brown, J. A. M. A. **81**:1950 (Dec. 8) 1923.

In albino rats and a dog, these investigators were unable to produce cutaneous manifestations by intravenous injections of large amounts of uric acid.

THE TRANSMISSION OF ARSENIC FROM MOTHER TO FETUS. F. P. Underhill and F. G. Amatruda, J. A. M. A. **81**:2009 (Dec. 15) 1923.

The efficacy of antenatal syphilitic treatment has been conclusively demonstrated clinically, but an explanation of the unusually good results obtained in these cases has not been entirely satisfactory. To elucidate this question, these

investigators injected neo-arsphenamin into pregnant rabbits and cats and examined the maternal and fetal tissues for arsenic. The fetal tissues never contained more than a trace of arsenic, but the maternal liver and placenta stored up arsenic, as the amount found in these organs was increased in proportion to the number of injections given. The explanation offered for the efficiency of antenatal treatment of syphilis, especially in the new-born, is that the spirocheticide acts in greater concentration and more directly on the spirochetes in the placenta.

MICHAEL, Houston, Texas.

THE EFFECTS OF ROENTGEN RAYS AND RADIOACTIVE SUBSTANCES ON LIVING CELLS AND TISSUES. LEO LOEB, J. Cancer. Res. **7**:229 (Oct.) 1922.

This is an excellent, comprehensive fifty page essay, with extensive bibliography, summarizing the views of the author and authoritative American and foreign investigators. The following are observations of dermatologic importance:

1. The main effects of radium and roentgen rays on tumors consists in a direct injurious effect of the rays on the tumor cells, in which the primary and most far reaching changes result from action on the chromatin of the cell nucleus. Secondary to this, reactions of the host may play a part in holding in check for variable periods of time, or in injuring still further, tumor cells which have been primarily injured by radiation.

2. Intensities of radiation weaker than injurious quantities may stimulate cells and tissues to increased activity, but such stimulation is temporary and followed by retardation and degeneration, the accelerated course of metabolic and structural changes leading to derangements in the life cycle of the cells. The development of carcinoma or sarcoma from long continued stimulation by radiation is the only exception to this rule. Epidermal proliferation is stimulated by weak doses repeated at suitable intervals.

3. Different tissues are unequally affected by radium and the roentgen rays, according to the varying intensity of their proliferative activities and differences in degree of general sensitiveness. Regenerating tissues, like embryonic tissues, are more sensitive because less differentiated and more actively dividing; which explains retarded healing in an irradiated skin wound. The hair follicles are the most sensitive of the skin appendages; the skin glands are relatively resistant. Cartilage is especially resistant. Changes found in the epidermis after radiation are due to direct action, but they are also secondary to thickening and occlusion of the blood vessels.

4. Rapidly growing tumors are generally more sensitive than most other tissues, and resting cancer cells than resting normal cells. In squamous cell carcinoma there is a tendency of the cells to differentiate, while in basal cell carcinoma the cells remain relatively simple and undifferentiated, thus accounting for the greater resistance of squamous cell lesions. There is no "carcinoma or sarcoma dose," there being a great variability for different types of tumors and for the same type in different persons, as well as a factor of individual resistance in the tumor cells themselves.

5. Radiation acts immediately, although its effects are usually not noticed until after a time interval; the latent period is therefore apparent rather than real.

6. A definite ratio exists between the biologic effects of radiation and the readiness with which the rays are absorbed by cells and tissues. Differences in effects between various rays are quantitative rather than qualitative.

7. The condition of the system on which the rays act is of primary importance in determining the end result of the interaction between the rays and the organism.

8. In the treatment of carcinoma, keloids and similar lesions, the first dose is the most effective. When radiation is applied to tumors at long intervals, the action is less and less effective, apparently due to the development of tissue or cell immunity.

9. A breakdown and solution of protein substances in the radiated tissues and the subsequent diffusion of these substances into the circulation is the cause of the intoxication noted after irradiation. The greater the skin area exposed to radiation, the more severe is the intoxication.

THE RELATIONSHIP OF CELLULAR DIFFERENTIATION, FIBROSIS, HYALINIZATION AND LYMPHOCYTIC INFILTRATION TO POST-OPERATIVE LONGEVITY OF PATIENTS WITH SQUAMOUS CELL EPITHELIOMA OF THE SKIN AND LIP. Lester D. Powell, J. Cancer Res. **7**:371 (Oct.) 1922.

From a histologic study of ninety-eight cases of squamous cell epithelioma at the Mayo Clinic, this investigator concluded that the average length of post-operative life of patients with epithelioma of the skin was increased by the presence of one or several of the factors mentioned. The greatest post-operative longevity occurred when there had been both cellular differentiation and fibrosis, following which ranked the combination of lymphocytic infiltration and fibrosis. The single exception to these observations was a decrease in postoperative life in the presence of fibrosis or hyalinization in lip epithelioma.

H. R. Foerster, Milwaukee.

THE INFLUENCE OF THE FACTORS OF SEX, AGE AND METHOD OF INOCULATION UPON THE COURSE OF EXPERIMENTAL SYPHILIS IN THE RABBIT. A. M. Chesney, J. Exper. Med. **38**:627 (Nov.) 1923.

Intratesticular inoculation was found to be superior to the intradermal method, females reacting less markedly than males when the latter method was used.

General invasion of the body occurred in rabbits inoculated intradermally, even though there was no reaction or only a slight one at the site of inoculation. This was demonstrated by positive lymph node transfer.

LOCAL RESISTANCE TO SPONTANEOUS MOUSE CANCER INDUCED BY X-RAYS. J. B. Murphy, J. Maisin and E. Sturm, J. Exper. Med. **38**: 645 (Nov.) 1923.

Grafts of spontaneous mouse cancer when replanted in an area previously exposed to an erythema roentgen-ray dose, failed to grow in 71.4 per cent. of the replants; similar grafts in untreated areas grew in 83.6 per cent.

Grafts, established and growing, disappeared in 76 per cent. of animals after the tumor and surrounding tissues had received an erythema roentgen-ray dose. Other and similar grafts, which had received a like dose of roentgen rays outside the body, and which had been implanted in the same animals, grew in 96 per cent. of cases. They believe that the beneficial effect of the roentgen ray is not due to direct action on cancer cells but to the reaction induced in the normal tissues.

JAMIESON, Detroit.

COMMON DRUG ERUPTIONS. JOSEPH JORDAN ELLER, New York State J. Med. **23**:415 (Oct.) 1923.

The author tabulates the eruptions sometimes seen following the ingestion of drugs. The article is particularly interesting in that it mentions the newer preparations, such as phenolphthalein, phenobarbital and cinchopen.

THE LIMITATIONS IN THE RADIOTHERAPY OF CANCER. FRANCIS CARTER WOOD, New York State J. Med. **23**:446 (Nov.) 1923.

This is a careful, conservative and convincing article. The author classifies the limitations of treatment by irradiation into four groups: physical, those depending on the general sensitiveness of the patient to radiation, the anatomic relations of the tumor and the resistance of the tumor to radiation. He finds no evidence to show whether one wave of the roentgen ray or the gamma rays of radium is more effective in killing tissues than another, and believes that it is merely a question of the amount of energy set free in the individual cell. He calls attention to the fact that certain persons tolerate irradiation poorly and that these people, whom it is impossible to detect in advance, make poor risks for radium treatment. The location of the tumor often makes treatment by irradiation inadvisable or even impossible; as, for instance, gastric tumors, which it is practically impossible to irradiate without at the same time doing serious damage to the liver, suprarenals or pancreas, which damage more than counterbalances any possible advantage that we gain by treatment of the tumor. The fourth limitation, the biology of the tumor, is the most important of all. It is well known that prickle cell tumors are much more resistant than basal cell tumors, and indeed are so resistant that they should never be treated with radiant energy. In conclusion, the author states his opinion that recourse should be had to surgery in all operable malignant tumors; and he states with equal conviction that the inoperable ones should be treated by irradiation, as meddlesome and partial surgery is worse than useless.

WILLIAMS, New York.

A CASE OF ANGIOKERATOMA OF MIBELLI. LOUIS QUEYRAT, Bull. Soc. franç. de dermat. et syph. **30**:327, 1923.

A girl, aged 18, with spina bifida occulta of the first sacral segment, presented typical angiomatous and verrucous lesions on the dorsa of the hands and feet, including the fingers and toes. A good photograph of one hand accompanies the article and diagrams showing the histologic features, including hyperkeratosis, elongation of the papillae and exereme dilatation of the blood vessels of the papillae and upper derma. The lesions had first appeared ten years previously. There were signs of pulmonary tuberculosis.

LICHEN PLANUS AND PIGMENTED NEVI IN A PATIENT WITH THE ADDISONIAN SYNDROME. Louste and Thibaut, Bull. Soc. franç. de dermat. et syph. **30**:334, 1923.

In a man, aged 40, with the typical syndrome of Addison, a characteristic eruption of lichen planus of about three months' duration was followed by exaggerated pigmentation. Several nevi and the scars from a few acne lesions had also become hyperpigmented.

A CASE OF SCLERODERMA IN PLAQUES, TREATED BY IONIZATION WITH POTASSIUM IODID. Louste, Jean and Thibaut, Bull. Soc. franç. de dermat. et syph. **30**:338, 1923.

Several patches, palm-sized and smaller, were repeatedly subjected to a current of 10 to 15 milliamperes, the negative electrode being soaked in 1 per cent. solution of potassium iodid and applied to the lesions. This was done three times a week, and in less than five months there was very noticeable amelioration in the appearance of the plaques. This method has been described before.

A CASE OF SUBACUTE INGUINAL LYMPHOGRANULOMATOSIS IN A WOMAN. Louste, Thibaut and Chavany, Bull. Soc. franç. de dermat. et syph. **30**:340, 1923.

Ten months previously, a woman, aged 32, had first noticed a lump in the left groin. It was incised and drained, but did not heal. There was a large spleen, but no other palpable lymphadenopathy, and the white blood cells numbered 9,000, of which 35 per cent. were counted as small mononuclears. A good photograph of the lesion is included. The case is reported in a preliminary way, for animal inoculations and biopsy examinations had not yet been done.

THE PRECANCEROUS DERMATOSIS OF BOWEN. Marcel Ferrand and Henri Rabeau, Bull. Soc. franç. de dermat. et syph. **30**:343, 1923.

On the thigh of a woman, aged 60, was a palm-sized plaque surrounded by several smaller patches, clinically and histologically typical of Bowen's precancerous dermatosis. These patches had been present for ten years, and there was no evidence of malignant change.

CHANGES IN HAIR AND PIGMENT, KERATODERMAS AND NAIL CHANGES FOLLOWING INJURIES TO PERIPHERAL NERVES: THEIR PATHOGENESIS. Levy-Franckel and Juster, Bull. Soc. franç. de dermat. et syph. **30**:346, 1923.

Three cases are reported: The first presented glossy skin, discolored nails and hypertrichosis of the affected hand; the second showed alopecia, café au lait spots, thickening of the nails and keratoderma of the foot involved; and a partially paralyzed hand presented hyperpigmentation and nail thickening in the third case, while the hairs of the forearm were increased in length. In the opinion of the authors, these changes, as well as other definite sympathetic abnormalities, may be traced to injuries sustained by the sympathetic fibrils in the affected nerve trunks.

A CASE OF ANGIOKERATOMA OF MIBELLI. A. Leri, A. Tzanck and Peron, Bull. Soc. franç. de dermat. et syph. **30**:353, 1923.

In a Greek youth, aged 18, there had been present since early childhood keratotic and angiomatous lesions on the first phalanges of both hands. Syphilis and pulmonary tuberculosis were both present, and according to the authors, either might have had some importance in the etiology of the skin condition. No biopsy examination is reported.

ANGIOKERATOMA OF MIBELLI WITH TENDENCIES TO GENERALIZATION. Sabouraud and Pignot, Bull. soc. franç. de dermat. et syph. **30**:355, 1923.

Since the age of 7, a child of 14 had presented lesions in which the vascular element greatly predominated over the keratotis, the left hand, buttocks, thighs, arms and legs having been successively involved, but not the fingers. The mother had died of tuberculosis.

EXUBERANT SUPPURATIVE TRICHOPHYTOSIS OF THE WRIST, SUCCESSFULLY TREATED BY TWO INTRAVENOUS INJECTIONS OF GRAM'S SOLUTION. Jeanselme and Burnier, Bull. Soc. franç. de dermat. et syph. **30**:356, 1923.

Five cubic centimeters of Gram's solution in 20 c.c. of serum were injected, and this was repeated after eight days. Photographs taken before and after the treatment show its apparent success. *Trichophyton gypseum* had been found in the lesion.

SUPPURATIVE TRICHOPHYTOSIS OF BOTH BUTTOCKS. Jeanselme and Burnier, Bull. Soc. franç. de dermat. et syph. **30**:359, 1923.

In a woman, aged 25, the left buttock was first involved, and later the right by direct contamination. *Trichophyton gypseum* was obtained from the lesions in pure culture, and it was apparent that the infection had occurred while the patient was taking care of horses, which was her daily occupation.

SYPHILITIC CHANCRE OF THE TONGUE. Burnier, Bull. Soc. franç. de dermat. et syph. **30**:360, 1923.

A man, aged 28, with erosive penile syphilids and a positive Wassermann reaction, presented a definitely raised, superficially eroded lesion near the midline of the dorsum of the tongue. There was no palpable adenopathy, but the organisms were found. A good photograph of the lesion in included.

A CASE OF XERODERMA PIGMENTOSUM. Jeanselme and Hufnagel, Bull. Soc. franç. de dermat. et syph. **30**:361, 1923.

The patient was a child, aged 10, whose cutaneous lesions had been present since the age of 6 months, the involvement being typical of xeroderma pigmentosum. The parents were second cousins.

A PIGMENTED PATCH ON THE BUCCAL MUCOSA IN A PATIENT WITH NO ADDISONIAN SYMPTOMS. Lortat-Jacob and Solente, Bull. Soc. franç. de dermat. et syph. **30**:363, 1923.

The patch was similar to those found in inhabitants of the tropics, although the patient was a native of Northern France.

PRURITUS ANI AND RECURRENT HERPES OF THE BUTTOCK IN A PATIENT WITH POTT'S DISEASES; SPINA BIFIDA OF THE FIRST SACRAL SEGMENT. RAVAUT and COTTENOT, Bull. Soc. franç. de dermat. et syph. **30**:365, 1923.

Since the age of 12 years, a man of 33 years had had recurring attacks of herpes of the left buttock, with pruritus of the left margin of the anus. Pott's disease had produced a dorsal deformity, but it is considered more likely that the herpes and pruritus were due to nerve irritation at the seat of the spina bifida.

A DERMATOSIS AND ELEPHANTIASIS OF THE CONGO CAUSED BY ONCHOCERCA VOLVULUS. OUZILLEAU, Bull. Soc. franç. de dermat. et syph. **30**:368, 1923.

This organism is a true nematode, whose embryonal forms are found only in the lymphatics. The adult forms are found in subcutaneous cysts, which occur principally over the bony prominences of the body. Organisms may be found in various parts of the body and in the derma of elephantiasic areas. They are never found in blood vessels; their presence apparently gives rise to hyperkeratosis, papillary hypertrophy and leukocytic infiltration, the dermal blood vessels being dilated in places, thrombosed in others, and surrounded by plasma cells. As a terminal stage, depigmented patches are sometimes formed, as in lepra and syphilis. There is a photomicrograph showing the organisms.

LEUKOPIGMENTARY NEVUS AND PERINEVIC VITILIGO. J. MONTPELLIER and A. LACROIX, Bull. Soc. franç. de dermat. et syph. **30**:371, 1923.

One example of each type is described. The first is exemplified in the case of a man, aged 21, on whose shoulder there was a pigmented nevus with a depigmented halo; on his back were several pigmented nevi and one depigmented spot. In the second case, that of a boy, aged 15, there were widely scattered patches of vitiligo of one year's duration, some of which surrounded nevi. The authors believe that the etiology is the same in both types.

A CASE OF TERTIARY SYPHILIS WITH GENERALIZED CORNEOUS SYPHILIDS AND LOCALIZED PSORIASIFORM AND ECZEMATIFORM SYPHILIDS. MOURADIAN (GOUGEROT), Bull. Soc. franç. de dermat. et syph. **30**:373, 1923.

In a man, aged 63, there had been a recurrent eruption of fifteen years' duration. There was a definite history of syphilitic infection at the age of 18 and a positive Wassermann reaction, and there was some question as to whether there was not a superimposed psoriasis, but as a result of a therapeutic test, the author considers the lesions syphilitic, of a peculiar type. No biopsy report is given.

TRICHOPHYTOSIS OF THE ANUS. DUBOIS, Ann. de dermat. et syph. **4**: 526 (Aug.-Sept.) 1923.

In a girl, aged 20, there was an erythematosquamous circle about the anal orifice, bordered with tiny vesicles. There is a photograph of the skin lesions, and also three showing the morphology and cultural characteristics of the organism, a Trichophyton of feline origin.

BOWEN'S DYSKERATOSIS WITH CANCEROUS DEGENERATION, LOCAL AND LYMPHATIC. DANEL, Ann. de dermat. et syph. **4**:529 (Aug.-Sept.) 1923.

With the aid of a clinical photograph and two photomicrographs, the author describes a case occurring in a man aged 65 years. On the forearm were lenticular squamous papules of forty years' duration and an ulcer, which had been present for six months, clinically resembling a basal cell epithelioma, on a cicatricial base. It was apparently destroyed by electrocoagulation, but returned after several years, with axillary adenopathy. Epitheliomatous cells were found in the excised lymph node, and there was soon a lethal termination.

A CASE OF TRICHOPHYTIC CONJUNCTIVITIS. ROMAN LESZCZYNSKI, Ann. de dermat. et syph. **4**:536 (Aug.-Sept.) 1923.

A girl, aged 14, with trichophytosis of the face, trunk and upper extremities, proved microscopically, developed an inflammation of the left upper eyelid, which reacted to trichophytin and which was apparently finally completely cured after intravenous injection of Lugol's solution for three weeks.

A PRURITIC ERYTHEMATOVESICULAR ERUPTION PRODUCED BY THE DUST OF BARLEY AND OTHER CEREALS. M. HODARA, H. BEHDJET and SUREYA, Ann. de dermat. et syph. **4**:538 (Aug.-Sept.) 1923.

This eruption is due to an organism in the grain, as described by the authors in the *Dermatologische Wochenschrift* of March 10, 1923, and recently abstracted in the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY.

THE TECHNIC AND PRACTICAL VALUE OF MEINICKE'S PRECIPITATION REACTION. C. KRUCHEN, Dermat. Wchnschr. **77**:945 (Aug. 4) 1923.

With active serums at room temperature, the author concludes that this is the most rapid and simple of the reliable reactions adaptable for the use of laboratory or practitioner as a substitute for the Wassermann reaction.

UNUSUAL LEUKODERMA AND ITS DIFFERENTIATION FROM VITILIGO. ERICH LANGER, Dermat. Wchnschr. **77**:913 and 951 (July 28 and Aug. 4) 1923.

From the clinic of Buschke, Langer describes four cases of leukoderma in children with acquired syphilis, a case of leukoderma psoriaticum, one following pityriasis rosea, and one following a microsporon infection. In his opinion, the sites of predilection of leukoderma and of vitiligo differ, and also the arrangement of the affected areas. Vitiligo occurs especially on pigmented parts, such as the face, genitals and buttocks, and the patches of depigmentation, more intensely depigmented than those of leukoderma, tend to be symmetrical and to become confluent, which is not true of the irregular, often netlike areas of leukoderma. The etiology of these affections is not necessarily syphilitic in every case.

CONTRIBUTION REGARDING THE TOXIC ERYTHEMAS. EMANUEL WOHLSTEIN, Dermat. Wchnschr. **77**:957 (Aug. 4) 1923.

A female patient developed an erythematous eruption after taking very small amounts of calomel, there being no other manifestations of mercurial intoxica-

tion. In the opinion of the author, vasomotor disturbances were perhaps the cause.

TREATMENT OF OBSTINATE VENEREAL ULCERS BY MEANS OF TARTRATE. J. GOLDBERGER, Dermat. Wchnschr. **77**:984 (Aug. 11) 1923.

A nonsyphilitic ulcer of the glans penis in a patient who had never been in the tropics healed readily after the intravenous injection of several doses of antimony tartrate.

DIAGNOSTIC INOCULATION TESTS WITH MICROSPORON IN FUNGUS INFECTIONS DUE TO THE MICROSPORON AND SIMILAR ORGANISMS (TRICHOPHYTON INFECTION: FAVUS). L. ARZT and H. FUHS, Dermat. Wchnschr. **77**:997 (Aug. 18) 1923.

The product of the Hoechst firm, especially extract No. 1, which is prepared from *Microsporon Audouini*, is best administered intracutaneously in a dilution of 1:50 with a 0.25 per cent. phenol solution. Reactions occur at the site of inoculation in patients with microsporon and trichophyton infections, and in the latter about as distinctly as though trichophytin had been injected. Inoculations were negative in cases of favus.

PSORIASIS: THE EFFECT OF IODIN AND THE ETIOLOGY. LEVEN, Dermat. Wchnschr. **77**:999 (Aug. 18) 1923.

The author reports a case of arthropathic psoriasis in which the lesions disappeared under the administration of potassium iodid, whose influence on the thyroid gland and metabolism may have some bearing here.

A SPEEDILY FATAL CASE OF FOOT-AND-MOUTH DISEASE IN MAN. T. FAHR, DERMAT. Wchnschr. **77**:1025 (Aug. 25) 1923.

A case is described, occurring in the 8-year old son of a butcher, and the histologic findings are described in detail, with the aid of a sketch showing the ballooning degeneration of the epidermal cells, hyperkeratosis, degenerative changes in the stratum germinativum of the hair follicle and scattered leukocytoid cells between the epidermis and cutis.

THE MICRO-REACTION OF MEINICKE. P. DOHNAL, Dermat. Wchnschr. **77**:1029 (Aug. 25) 1923.

A technic is outlined whereby very small amounts of blood may be submitted to the Meinicke test and the results read by means of the microscope.

CEREBROSPINAL FLUID AND EYE CHANGES IN EARLY SYPHILIS. PAUL GLEMANN, Darmat. Wchnschr. **77**:1033 (Aug. 25) 1923.

As the result of a systemic examination of the eyes and cerebrospinal fluid in 243 patients with early syphilis (primary and secondary), the author reports having found a pathologic fluid in 36.6 per cent. of the cases, and ocular changes in 36.2 per cent.; but in only 4.5 per cent. of the cases were the eye changes pronounced syphilitic, and in only 1.9 per cent. did they occur in patients with positive fluid findings.

CONTRIBUTIONS TO THE SUBJECT OF NETLIKE SKIN CHANGES, ESPECIALLY THOSE OF INFLAMMATORY NATURE. E. Lehner and D. Kenedy, Dermat. Wchnschr. **77**:1049 (Sept. 1) 1923.

With the livid areas of cutis marmorata as a starting point, eruptions of netlike configuration may result from external irritation, such as that due to heat, cold, vapor, sulphur applications, oil, tar, impure petrolatum, paraffin and various ointments; or it may be due to internal causes, such as syphilis, tuberculosis, endocrine disturbances, endocarditis, etc. Cases are cited.

TREATMENT OF XANTHELASMA BY CAUTERIZATION. J. Fabry, Dermat. Wchnschr. **77**:1052 (Sept. 1) 1923.

Substituting for Unna's Mikrobrenner the galvanocautery with a fine needle point, and working with several successive sittings in extensive cases of eyelid involvement, the author has secured good results, and he feels that this agent should be more generally used.

A CASE OF THRICE REPEATED INFECTION WITH SYPHILIS. Hugo Hecht, Dermat. Wchnschr. **77**:1053 (Sept. 1) 1923.

The author has recently reported five cases of syphilitic reinfection occurring in patients who had received treatment for the first infection, and he now reports the third infection occurring in one of these, after treatment of the second infection. Following intercourse with a woman whose skin bore active manifestations of syphilis in the secondary stage, a penile ulcer appeared, and it was found to harbor *Spirochaeta pallida*.

SMALL DOSES IN THE TREATMENT OF DISEASES OF THE SKIN. Heinrich Perl, Dermat. Wchnschr. **77**:1056 (Sept. 1) 1923.

By means of one-fifteenth to one-twentieth of a minimum erythema dose of roentgen rays, usually filtered through 2 or 3 mm. of aluminum, the author has apparently been able, with a single exposure, to hasten the healing of various stubborn ulcers, including roentgen-ray "burns" and ulcerative lupus vulgaris.

INTRAVENOUS INJECTION OF GLUCOSE IN THE TREATMENT OF SYPHILIS. Eugen Rubin, Dermat. Wchnschr. **77**:1080 (Sept. 8) 1923.

Starting with an initial dose of 0.3 gm. of neo-arsphenamin, as an average, dissolved in 20 c.c. of 50 per cent. glucose solution, the author secured results parallel to those following the use of neo-arsphenamin alone or with mercury, and it seemed that untoward reactions were avoided. This was probably due to a supposedly protective property in the physicochemical makeup of the glucose solution.

TOXIC ERYTHEMA AND ZOSTER FOLLOWING THE INTRAMUSCULAR INJECTION OF BISMUTH. Emerich Lehner, Dermat. Wchnschr. **77**:1107 (Sept. 15) 1923.

These eruptions, the erythema being generalized, appeared in a tabetic patient, aged 49, within two days after the injection of 2 c.c. of a 10 per cent. suspension of the tartrate in olive oil. They were ushered in by headache, fever and malaise, which were noticed a few hours after the injection.

PRELIMINARY NOTE ON A NEW TREATMENT OF LUPUS VULGARIS. HERMANN MUCHOW, Dermat. Wchnschr. **77**:1113 (Sept. 22) 1923.

The new product is "Pyotropin-Pyotren," patented and sold by a firm in Hamburg. The treatment consists of two parts. The first part is a liquid containing calcium carbonate, potassium phenolate and some phenol; the second part is an ointment containing salicylic acid, sodium salicylate, glycerol, sugar and spermaceti. No metallic salts or iodids were found in either preparation. The first part is painted over the lesion, which is then covered with thin gauze buttered with the second part, and an air-tight dressing applied. This is repeated twice a week for about eight times, while suppuration occurs. It is then stopped and boric acid ointment is applied to complete healing. At Unna's clinic it has been used successfully by the author in twelve stubborn cases, which are described.

DIPHTHERIA OF THE SKIN. A. LENZ, Dermat. Wchnschr. **77**:1116 (Sept. 22) 1923.

The author describes a case in which the lesion appeared as a furuncle on the abdomen of an old man. The organisms were found, and recovery followed the use of moist local applications, no serum being given. The confusing features of this cutaneous affection are discussed, and the author concludes that, according to the case in hand, one or both of the following procedures seems to be indicated: (1) the systemic administration of antidiphtheric serum, (2) the local application of disinfectants, compresses soaked with the serum, or ultraviolet light.

THE TREATMENT OF ULCERS OF THE LEG. KARL SCHREINER, Dermat. Wchnschr. **77**:1119 (Sept. 22) 1923.

Having tried many remedies with scant success, the author finally had excellent results from the application, in rotation, of four pastes, the first of which contains 4 per cent. of lead, the second 1.5 per cent. of bismuth, the third 0.5 per cent. of copper, and the fourth silver. During this treatment he found that rest in bed was essential, with the freshening of the margins of the ulcers, which should be done daily if possible.

PARKHURST, Toledo, Ohio.

CARCINOMA THERAPY. J. WETTERER, Deutsch. med. Wchnschr. **48**:480, 1922.

Carcinoma cachexia and anemia can be beneficially influenced by injecting the blood serum of youthful persons into the buttocks of patients with carcinoma. The author employed the serum of children or grandchildren in his experiments. He says that he has seen this therapy result in an increase of the red blood corpuscles and of the hemoglobin content.

BY-EFFECTS OF NEO-ARPHENAMIN. H. REINHARD-EICHELBAUM, Deutsch. med. Wchnschr. **48**:804, 1922.

The author believes that the individual dose of arsphenamin can be increased and the intervals between the administrations shortened by prophylactic administration of epinephrin subcutaneously. He injects from 0.5 to 0.75 c.c. of a 1:1,000 solution of epinephrin from five to ten minutes before giving an injection of arsphenamin, and he has observed a beneficial influence on the disturbing vasomotor syndrome.

TREATMENT OF PSORIASIS VULGARIS WITH THYMUS EXTRACT. B. G. Gross, Deutsch. med. Wchnschr. **48**:1211, 1922.

This is a report of two obstinate cases which had persisted for years. The author administered a thymus extract, of which 1 c.c. corresponded to 2 gm. of thymus gland. From ten to fifteen injections were made, the equivalent of 20 to 30 gm. of thymus gland. Both patients were completely cured.

MORPHOLOGIC INVESTIGATIONS INTO THE "ABORTIVE CURE" OF SYPHILIS. W. Kolle, Deutsch. med. Wchnschr. **48**:1301, 1922.

Extensive experiments on rabbits showed that an "abortive cure" in early cases is not possible even with the largest doses of arsphenamin.

NONSPECIFIC CURATIVE ACTION OF MERCURY. A. Buschke and E. Sklarz, Deutsch. med. Wchnschr. **48**:1538, 1922.

The effect of mercury must be judged from the point of view of colloid chemists. An absolute specificity of mercury does not exist.

ROENTGEN-RAY INTOXICATION AND CACHEXIA. H. Hirsch, Deutsch. med. Wchnschr. **48**:1646, 1922.

Both disorders are due to a disturbance of the endocrine system, according to the author. He advises the administration of organic extracts (hypophysis and suprarenal glands) which in his experience give beneficial results.

ANGIOSPASM IN THE PATHOGENESIS OF THE VASOMOTOR TROPHIC NEUROSES. Bruening, Deutsch. med. Wchnschr. **48**: No. 47, 1922.

The author's experience in periarterial sympathectomy shows that the angiospasm not only concerns the contraction of the smaller but also of the larger arteries. In Raynaud's disease the angiospasm is not only a symptom, but it is the essence of the disease itself. The basic disturbance is the increase of the tonus in the sympathetic nervous system.

EXPERIMENTAL RESULTS IN ENDOCRINE DISTURBANCES CAUSED BY THALLIUM. A. Buschke and B. Peiser, Klin. Wchnschr. **1**:995, 1922.

The authors studied the influence of thallium on the growth of young tadpoles by adding thallium aceticum to the water. The growth of the animals as compared with that of the control animals was distinctly inhibited. Metamorphosis took place late. Dwarf frogs were developed. The authors conclude that thallium acts on the endocrine system. The alopecia caused by thallium is therefore also of endocrine origin.

ROENTGEN-RAY INTOXICATION. E. Schlagintweit and H. Sielmann, Klin. Wchnschr. **1**:2136, 1922.

Irradiation decreases the sodium chlorid content of the serum. Administration of sodium chlorid by mouth or by rectum is therefore advised as the best measure to combat roentgen-ray nausea.

GENESIS OF URTICARIA. H. MAUTNER, Klin. Wchnschr. **1**:2284, 1922.

The author explains the urticarial exanthem as being due to a contraction of the veins, which causes local stagnation, transudation of fluid and circumscribed edema.

COLORIMETRIC DETERMINATION OF THE POSITIVE WASSERMANN REACTION. H. HECHT, Med. Klin. **18**:1348, 1922.

(1) Five-tenths cubic centimeters of sheep blood corpuscles, 9.5 c.c. of physiologic sodium chlorid and (2) 0.5 c.c. of blood corpuscles and 1 c.c. of distilled water are shaken well. Eight and one half cubic centimeters of physiologic sodium chlorid are then added. In six tubes containing the antigen unit and the complement unit increasing quantities of (1) are added (from 0.1 to 0.5 c.c.) and decreasing quantities of (2) (beginning with 0.5 down to 0.1 c.c.).

LOCALIZED RELAPSING DERMATITIS AFTER MERCURY. E. LANGER, Med. Klin. **18**:1406, 1922.

The author reports the second case in the literature in which a fixed erythema developed after mercury medication. Following the second injection of mercuric salicylate the patient developed, one hour after the injection, a pronounced erythema, which however disappeared three hours later. There is no explanation for the sudden development and disappearance. The author believes that there was a disturbance of an endocrine regulating organ.

TREATMENT OF VARICES WITH MERCURIC INJECTIONS ACCORDING TO THE METHOD OF LINSER. J. ROSNER and E. WOHLSTEIN, Med. Klin. **18**:1527, 1922.

The authors report three cases which had withstood all other methods and which were successfully influenced by injections of mercuric chlorid.

MELANODERMA IN PERNICIOUS ANEMIA. M. MOSSE, Med. Klin. **18**:1085, 1922.

The author reports a case of pernicious anemia in which, six months after the administration of arsenic, a pronounced blackening of the skin developed, chiefly on the abdomen, breast and back. The pigment was located in the stratum papillatum, which was also infiltrated with round cells. There was no arsenic traceable in the skin. The pigmentation was due to an increase of melanin, which was caused by the arsenic. The pigment was free from iron; silver nitrate made it black, and hydrogen peroxid bleached it.

THE PREVENTION OF CONGENITAL SYPHILIS. G. A. WAGNER, Med. Klin. **19**:18, 1923.

The author advises energetic antisyphilitic treatment during pregnancy. The Wassermann test should be made as early as possible at a time when a nonsyphilitic reaction is improbable.

SPIROCHETE CULTURES ON SOILS CONTAINING ARSPHENAMIN. W. KRANTZ, München. med. Wchnschr. **69**:586, 1922.

Experiments show that addition of arsphenamin and neo-arsphenamin to the soil does not impede the growth of the spirochetes, nor do they suffer morphologically.

VALUE OF AN ALBUMIN FROM TUBERCLE BACILLI FOR SPECIFIC DIAGNOSIS OF TUBERCULOSIS. E. TOENNIESSEN, München. med. Wchnschr. **69**:957, 1922.

The author tested the diagnostic value of an albumin which he obtained from tubercle bacilli by a new method. This protein is precipitated by acetic acid, contains 12.6 per cent. nitrogen, no phosphorus or purin bases. The author claims that his reaction is more reliable than the old tuberculin reaction. Cases which did not respond to 5 mg. or even 10 mg. of old tuberculin gave a distinct reaction with 0.1 mg. of the new protein.

TREATMENT OF PROGRESSIVE PARALYSIS WITH SILVER ARSPHENAMIN. STERN-PIPER, München. med. Wchnschr. **69**:1007, 1922.

The author reports eleven cases in which he administered 7 gm. or more of silver arsphenamin. There were no disturbances, and seven patients were considerably improved. In two cases the progress of the disease was stopped, while in two cases it was not influenced. In all cases, there was improvement in the reactions, although these did not become completely negative in any case.

THE PEPSIN-PREGL SOLUTION IN THE TREATMENT OF INOPERABLE MALIGNANT TUMORS. E. PAYR, München. med. Wchnschr. **69**:1330, 1922.

The author claims that good therapeutic results are obtained quickly in the treatment of tumors which involve the blood vessels and the nerves. These tumors are liquefied by injecting the Pepsin-Pregl solution, and thereby often are rendered operable. This method is indicated particularly in sarcoma and lymphosarcoma.

CUTANEOUS HEMORRHAGES FOLLOWING INJECTIONS OF ARSPHENAMIN. H. FEIT, München. med. Wchnschr. **69**:1345, 1922.

The author observed pinhead sized skin hemorrhages on the arm of a patient following the first injection of neosilver arsphenamin. Whether these were due to syphilitic involvement of the capillaries or to the arsphenamin, could not be decided. Hemorrhages of this kind should be a warning to discontinue medication.

AHLSWEDE, Buffalo, N. Y.

Society Transactions

PITTSBURGH DERMATOLOGICAL SOCIETY

Regular Meeting, Sept. 20, 1923

STANLEY CRAWFORD, M.D., *Presiding*

PITYRIASIS LICHENOIDES CHRONICA? Presented by DRS. SCHWARTZ and BUSMAN.

D. T., a man, aged 24, a truck driver, presented a generalized erythemato-squamous eruption. The elementary lesion was a small macule or maculopapule with a fine adherent scale which could be scratched off without bleeding. There was little involvement of the scalp and none of the palms and soles. The buccal mucous membranes were of a bluish tint and presented a few scattered reddish papules. There was a definite general adenopathy. There were no subjective symptoms, although occasionally there was slight itching. The condition was of six years' duration and remained practically unchanged. There was a slight improvement in hot, dry weather.

DISCUSSION

DR. WERTHEIMER said he felt that this was a case of parapsoriasis.

PAPULONECROTIC TUBERCULID. Presented by DR. WERTHEIMER.

Mrs. S. J., aged 37, married, had had the disease for eleven years. The extensor surfaces of the upper extremities, the palms, fingers and buttocks showed bluish red, pea and slightly larger sized papules with necrotic centers. There were innumerable smooth, white atrophic scars.

DISCUSSION

DR. BEINHAUER said the patient had been treated for syphilis for years and had had ten negative Wassermann tests.

DR. JACOB suggested looking for focal infection together with a thorough physical examination. He cited a similar case that cleared up under general hygienic treatment and vaccines. The vaccine used, a green streptococcus, was obtained from the infected tonsils. An enteroptosis also existed.

DR. HOLLANDER said he thought that a toxic goiter had an influence in this case. He noticed a slight tremor of the hands which was often observed in the later stages of thyroid intoxication.

PEMPHIGUS VULGARIS. Presented by DR. BEINHAUER.

Mr. L. M., aged 70, married, had had the disease for one year. Bleblike lesions first appeared on the legs and soon spread over the entire body. They sometimes appeared within the mouth. The lesions varied in size from that of a dime to that of a silver dollar and were always on a noninflammatory base. Some of the lesions were hemorrhagic.

DISCUSSION

DR. SCHWARTZ said he had noted a marked pyorrhea and decay of the teeth and advised against extraction in these cases saying that such a procedure usually caused a fatal toxemia.

DR. WERTHEIMER said he had noticed a poor hygienic condition of the mouth in all patients with pemphigus that he had seen.

DR. BEINHAUER advised against extraction of the teeth in this case owing to the hemorrhagic character of the lesions.

DR. CRAWFORD said he could see no contraindication to extraction of the teeth provided only one or two teeth were removed at one time.

PROGRESSIVE IDIOPATHIC PIGMENTATION. Presented by DR. PHILLIPS.

F. E. J., aged 27 months, a girl, a blonde, presented over the face, forehead, neck, right arm, buttocks and right leg, smooth, reddish brown, nonelevated areas of pigmentation varying from pinhead to palm size. She weighed 4 pounds (1.8 kg.) at birth and was premature by one month. Her family history was negative. She was 5 months old when the pigmentation started on her right cheek, and it has continued to spread since that time. None of the areas has ever disappeared, but they have continued to spread and grow darker. Scrapings for fungi have been repeatedly negative and bleaching lotions have had little effect.

DISCUSSION

DR. BUSMAN said he disagreed with the diagnosis and believed the condition to be a fungus growth of the aspergillus type.

DR. WERTHEIMER said the lesions were nevoid in character and that probably this was an unusual case of nevus pigmentosus.

DR. CRAWFORD said he thought the lesions on the leg suggested a nevus unius lateris. The lesions elsewhere resembled a tinea versicolor. He thought a biopsy would be of interest.

DR. PHILLIPS said that repeated cultures for fungi were negative, and therefore he doubted a fungus invasion.

Regular Meeting, Oct. 18, 1923

STANLEY CRAWFORD, M.D., *Presiding*

A CASE FOR DIAGNOSIS. Presented by DR. BEINHAUER.

Mr. J. W. C., aged 33, single, for the past six or eight weeks had presented an ulceration of the mouth. Between the upper and lower molars of the left side of the mouth there was a mass which was cauliflower and granulomatous in character; the upper border was definitely punched out, while the base was rough, irregular and covered with a mucopurulent discharge. There were no pearly nodules, no free bleeding and no tenderness, but there was marked submaxillary adenitis. Smears taken from the discharge showed streptococci and staphylococci, and culture showed *Micrococcus catarrhalis*. No Vincent's spirilla was found. The blood Wassermann reaction was negative. Physical examination was negative except for a generalized adenophathy.

DISCUSSION

Dr. Phillips said there was a possibility of carcinoma, yet the age of the patient seemed not to favor such a diagnosis. A chancre was also considered, but he could not elicit any adenopathy.

Dr. Guy offered the diagnosis of epulis.

Dr. Crawford considered the condition a prickle cell carcinoma from the clinical characteristics. The mass appeared friable and granular and bled easily. The process was an infiltrative one, and the patient's age was not a sufficient reason for not considering malignancy.

SARCOMA (?) Presented by Drs. Guy and Jacob.

A man, aged 24, presented a sharply marginated ulcer on the back of right thigh of four weeks' duration. It began after a baseball injury as a firm, red, egg sized nodule. About a month later it was incised without obtaining pus. The lesion spread peripherally. About two months later it was curetted. At the time of presentation it was an open ulceration without necrotic edges measuring 4 inches (10.16 cm.) in diameter and about three-quarters of an inch (1.9 cm.) in depth. The edges were hard and indurated and evidenced the spreading of a nodular condition beneath the skin. The blood Wassermann and tuberculin reactions were negative.

DISCUSSION

Dr. Phillips said he considered the condition either a gumma or a sarcoma, but he felt that the mutilations present obscured the clinical picture.

Dr. Hollander said he believed it was a malignant condition.

Dr. Beinhauer said he thought it was a case of spontaneous gangrene, and he recalled a similar case which was diagnosed as gangrene and which proved by biopsy to be a large round cell sarcoma. He believed that this might be a similar condition.

Dr. Crawford said he thought the edges of the ulceration, which showed a variety of pale colors, were suggestive of gangrene. The deeper hard infiltrative process extending peripherally, which was of fairly rapid development, he believed would prove to be sarcomatous.

Dr. Guy said that a therapeutic test had been made. The physician who referred the case had given idodids for one month, and one injection of neo-arsphenamin. He favored a diagnosis of sarcoma on account of its development following an injury. It was a firm painless, nodule which when incised cut like wet leather. The lesion spread peripherally and was curetted, which accounted for the necrosis on the basis of a secondary infection. The biopsy report showed this to be a round cell sarcoma. Roentgen-ray plates of the chest showed no involvement of the lungs. Filtered roentgen rays and radium will be used for treatment.

ULCERATIVE STOMATITIS, CHRONIC RECURRENT. Presented by Dr. Crawford.

Miss M. F., aged 29, an American, had had frequent and periodic attacks of ulcers of the mouth since infancy. The ulcers began as small "blisters" which soon broke down, leaving a raw surface which quickly enlarged into an irregular ulcer. The floors of the ulcers were a dirty gray and were covered with a viscid secretion. The edges were bright red and rather abrupt. Each ulcer varied in

diameter from 3 to 5 mm. They occurred anywhere in the mouth, on the labial, lingual or buccal mucosa and in the oropharynx. When the ulcers were present the saliva was much increased. For a short period in her girlhood she had been comparatively free, but during the past four years the eruptions had been marked and frequent. She noticed them especially just prior to her menses, which were irregular. She had noticed similar ulcerations at the anus at times. During an attack she was irritable and nervous. Thorough examination for a cause had thus far been futile. The appendix and tonsils had been removed as possible septic sources.

FOLLICULITIS DECALVANS. Presented by Dr. H. G. Wertheimer.

Mr. C. C., aged 19, presented, for the most part on the posterior portion of his head and neck, pinhead sized inflamed follicles, scarring, and here and there a pustule pierced by a hair. The condition had been present for the last four years.

ERYTHEMA PERSTANS. Presented by Dr. Hollander. (Fordyce-MacKee.)

Mr. S. P., aged 29, an Austrian Jew, a salesman, had presented the disease for the past sixteen months. It was symmetrically distributed over the malar prominences of the face. The individual lesion consisted of a small round maculopapule with well defined edges and covered by minute scales. The lesions coalesced and formed irregular, erythematous, slightly bluish elevated patches. No atrophy, telangiectasia, pigmentation or apple-jelly nodules were seen. Two units of roentgen ray were given at weekly intervals, with marked improvement. This was followed by carbon dioxid snow, causing complete disappearance of the lesions with pigmentation around the areas treated. The face remained clear for three or four months, and at the time of presentation the foregoing picture was seen. Two intravenous injections of neo-arsphenamin were given, causing a change of color in the lesions. The blood Wassermann test was negative on Sept. 5, 1922, and doubtful on Sept. 25, 1923. The patient had been operated on for an ulcerated stomach four years ago.

DISCUSSION

It was the consensus of opinion that this was a case of lupus erythematosus.

Dr. Hollander said that Drs. Fordyce and MacKee had presented a similar case as one of erythema perstans faciei following lupus erythematosus, and the condition had cleared up under treatment with neo-arsphenamin.

LUPUS VULGARIS. Presented by Dr. H. G. Wertheimer.

Mrs. R. R., aged 56, presented anteriorly to the left ear in the postauricular region and on the neck brownish red elevated patches composed of soft apple jelly nodules varying in size from that of a pea to that of a fifty cent piece. The patient said that the disease started at the age of 41. At the age of 12 the glands of the neck, at this site, were removed and twenty years following a nodule appeared in this scar.

DISCUSSION

Dr. Hollander said he agreed with the diagnosis.

EPITHELIOMA. Presented by Drs. Schwartz and Busman.

Mrs. W. McCann, aged 43 years, a housewife, presented several annular punched out scars on the right side of the cheek and neck. Intermingled with the scars were erythematous lesions with the same central depression and a

raised indurated border. There was a single lesion of the same character, anterior to the left ear. The lesions had been present for three years. The Wassermann reaction was negative.

DISCUSSION

Dr. Guy said he could with difficulty subscribe to the diagnosis of epithelioma. There were present white atrophic scars, telangiectasia and one or two active inflammatory scale covered lesions, suggestive of lupus erythematosus. Treatment might have altered the picture.

The consensus of opinion of other members present was that the case was one of lupus erythematosus.

EPITHELIOMA—BASAL CELL. Presented by Dr. Hollander.

Miss E. W., aged 54, an American, a domestic, presented a large area of destruction of tissue involving the entire left eye and cheek, from the eyebrow to the inferior maxilla and from the nose to the outer edge of the ear. The part was constantly bathed in a serous discharge, with frequent aching and throbbing. The condition started as an abrasion under the left eye twenty years before following an injury. She had had twenty-six roentgen-ray treatments in the course of three years, followed by eight more such treatments and finally by radium, the latter being used in 1915.

Regular Meeting, Nov. 15, 1923

Stanley Crawford, M.D., *Presiding*

DERMATITIS FACTITIA. Presented by Drs. Guy and Jacob.

A 45-year-old man, a tabetic, from the University Dispensary, presented a scattered generalized eruption comprising erosions, pigmentary spots and fine scarring. The erosive type of lesions were usually rounded and dime to half dollar sized. There were a few linear and oval lesions on the anterior aspect of the thighs and over the scapulae. Pigmentary spots, evidently the sites of healed lesions, were noted alone, or were confluent with scars or erosions. Across the shoulder blades were rows of parallel linear white scars measuring from 2 to 5 inches (5.08 to 12.7 cm.) in length and about one fourth to one half inch (6.3 to 12.7 mm.) in width. These lesions in places terminated in pigmentary spots or erosions. None of the lesions was infiltrated, and they were quite superficial. The condition was of fifteen years' duration.

DISCUSSION

Dr. Beinhauer said that he understood neurologists were of the opinion that syphilids were rare in tabetic persons, and that when present they were usually of a factitious nature.

Dr. Crawford agreed with the diagnosis and said he noted a marked pharyngeal anesthesia in this patient, a condition usually present in patients with self inflicted dermatoses.

Dr. Guy said that the bizarre appearance of the three types of lesions with linear scars, pigmentary spots and evident erosions led one to make a diagnosis of a self induced eruption.

PAGET'S DISEASE. Presented by Drs. Schwartz and Busman.

Mrs. S., aged 70, a housewife, presented a definite circular sharply marginated erythematosquamous dermatitis of the left breast, with the nipple as the central point. There was a fairly definite retraction of the nipple, and the whole area was firm and infiltrated. The condition began eight years before and gradually spread peripherally. Pathologic examination showed a thickening of the epithelial layer, an elongation of the rete pegs and a breaking through of the basal cells into the corium. The large balloon cells with central pyenotic nuclei were prominent.

LIVEDO RETICULARIS. Presented by Dr. Crawford.

Miss H., aged 20, an American, for the past two years had had a marked mottled condition of the anterior surface of both legs. The condition was a bluish vascular network interspersed with small irregular islands of normal skin, and extended from the knee to the ankle on the anterior surface of each leg. The condition followed prolonged exposures to the heat of a fire.

LEUKODERMA ACQUISITUM CENTRIFIGUM. Presented by Dr. Crawford.

Miss M., aged 17, an American, during the past two years had developed several round or ovoid whitish areas on the back and shoulders. Each area was the result of depigmentation, and the center was occupied by a small brownish globular elevation which had the appearance and consistency of a mole. The areas varied in diameter from 1 to 5 cm., and the central moles varied from 2 to 4 mm. The patient believed that she had always had the moles, and she said there had been no increase in the brownish pigmentation. There was a faint zone of hyperpigmentation about 10 mm. in width approximating the ivory white areas. On each upper thigh and over the spine of the lower part of the back were irregular palm sized islands of partial depigmentation typically vitiliginous. Physically the patient was healthy and normal. The presenter felt that the condition was a variant of vitiligo.

GENERALIZED GLANDULAR TUBERCULOSIS. Presented by Drs. Guy and Jacob.

A woman, aged 27 years, presented a painless progressive general adenopathy of more than six years' duration. The patient first noted enlargement of the cervical glands, the general examination which followed revealing involvement of mesenteric and mediastinal glands in addition to practically all the superficial chains. Softening was not a marked symptom, the glands usually attaining a moderate size and then remaining stationary. The patient had a persistent diarrhea and ran a constant high temperature varying from 99 to 101 F. She had had what was diagnosed as tuberculous pleurisy, but physical examination, including innumerable sputum examinations and roentgenograms, were negative. In spite of the generalized process with rise in temperature and diarrhea, the patient had lost little weight and with the exception of rather severe headaches enjoyed surprisingly good general health. A gland removed from the right axilla revealed a tuberculous structure, and the tubercle bacillus had been demonstrated.

DISCUSSION

DR. HOLLANDER said that in all his experience with tuberculosis he had never seen this type of tuberculous affection. He believed this case was probably due to the bovine type of organism.

DR. BUSMAN said he believed that intravenous neo-arsphenamin would be of benefit in this case.

DR. GUY said that a search of the literature showed that this was an extremely rare condition. Maylord, in his book on abdominal tuberculosis, described the condition in close agreement with this patient's symptoms. He (Maylord) suggested the possibility of primary glandular infection, but favored the likelihood of a secondary infection with frequent origin in intestinal ulceration.

BROMID ERUPTION. Presented by DRS. GUY and JACOB.

A woman from the University Dispensary, aged 29, presented a sharply marginated, elevated inflammatory lesion on the calf of each leg. The one on the right leg measured approximately 6 by 4½ inches (15.2 by 11.3 cm.), that on the left was about half this size. The lesions were brownish or purplish red, the surface being closely studded by minute follicular depressions and pinhead sized epidermal abscesses. The condition was of three weeks' duration and had developed in about ten days. Severe pain was noted subjectvely. The patient said that she had been taking bromids for two weeks prior to the inset of the condition. She had been treated by intravenous injections of normal sodium chlorid as suggested by Wile, and while bromin had not been found in the urine either before or after the injections, response to therapy, according to the presenters, had been sufficiently well marked to warrant a favorable therapeutic report.

DISCUSSION

DR. BEINHAUER said he recently saw a similar case similarly treated which resulted after the first intravenous treatment of physiologic sodium chlorid in an acute febrile reaction and nephritis.

DR. GUY said that 150 c.c. of physiologic sodium chlorid were given intravenously three times with an interval of three days.

POLYCYTHEMIA VERA (OSLER'S DISEASE). Presented by DR. HOLLANDER.

Mr. M. S., aged 56, presented a marked cyanosis of both hands, both feet and face. The skin was dry and showed a loss of elasticity. The condition was worse in winter. The mucous membrane was inflamed about the mouth and conjunctiva. The condition had existed since childhood but had became progressively worse. His mother and sister had a similar condition. The positive findings were: urine: slight trace of albumin, scattered casts; blood, red blood cells from 9,680,000 to 9,440,000; white blood cells, 17,400. The blood Wassermann test was ++++. There was marked stasis in the colon and pyorrhoea alveolaris.

DISCUSSION

DR. CRAWFORD said he had gathered in questioning the patient that he had been a heavy drinker of whisky until three years ago, and that the condition of pellagroid of alcoholics should be considered. He felt that as only two red cell counts of the blood had been made, further and prolonged study in this respect

should be made. The fact that his two previous and immediate ancestors showed the same condition (according to the patient's statement) he thought may have some bearing in making a diagnosis of Osler's disease.

Dr. Cohen said from his personal acquaintance with the man as a patient he knew that he had been a heavy drinker.

PARAPSORIASIS (BROCQ). Presented by Drs. Schwartz and Busman.

C. J., aged 50, a man, presented many split pea sized to large confluent patches. The lesions showed a slight branny desquamation and were practically asymptomatic. It began twelve years ago as small rounded lesions, and none have ever showed any tendency to involute. Histopathologic examination revealed a superficial inflammatory process involving the upper level of the corium with dilatation of the blood vessels, edema and perivascular cell infiltration. The epidermis was not thickened and showed moderate parakeratosis.

DISCUSSION

Dr. Hollander said he thought the condition resembled a type of seborrheic dermatitis, since it spread downward from the scalp over the neck and onto the upper part of the body and since the scaliness and infiltration were more marked than in the usual parapsoriasis. A mycotic condition, he felt, should also be considered especially since the patches over the lower part of the abdomen and upper part of the thighs were scaly, superficial and appeared to spread as does fungus invasions. He did not agree with the diagnosis as presented.

Dr. Guy said he believed the condition resembled rather a seborrheic dermatitis or a fungus infection, and he suggested that treatment be tried before establishing a diagnosis of parapsoriasis.

Dr. Busman said he felt a definite diagnosis could not be made and that a response to treatment should be sought.

H. G. Wertheimer, M.D., Secretary.

PHILADELPHIA DERMATOLOGICAL SOCIETY

Regular Monthly Meeting, Oct. 8, 1923

Fred D. Weidman, M.D., *Presiding*

TINEA CRURIS (DHOBIE ITCH). Presented by Dr. Brown.

W. D., a white man, aged 28, presented a sharply marginated eruption with an elevated papular border, 8 inches (20.3 cm.) in width and 10 inches (22.8 cm.) in length, extending over the buttock. The condition was of five years' duration and started while the patient was in the United States Army. It was preceded by an eruption on the toes which in a month was followed by the development of a circinate lesion in the genitocrural region. It had been treated by roentgen ray for a considerable length of time, the patient being given one-fourth skin unit each week.

DISCUSSION

Dr. Weidman said that when there was considerable papular element present in these cases they were particularly refractory to treatment.

A CASE FOR DIAGNOSIS. Presented by Dr. Greenbaum.

A white man, aged 54, presented on the anterior surface of both legs and on the anterior surface of the left thigh, rupia-like lesions of fifteen years' duration. These lesions despite previous thorough treatment at another hospital were uninfluenced. On close examination their rupial layer was found to be a scale crust, and not purely scale; methodical grattage did not elicit the pellicle found in ordinary psoriasis, and the exposed underlying surface oozed serum and became purpuric, but did not show the hemorrhagic purpura common to psoriasis. A histologic examination showed definite areas of spongiosis in the rete mucosa. Despite its close clinical appearance to psoriasis rupioides, the presenter believed that this was a particularly interesting form of psoriatic seborrheic eczema.

DISCUSSION

Dr. Knowles said he did not consider the case one of seborrheic dermatitis on account of the scale formation and distribution of the lesions.

Dr. Rose Hirschler said she believed it was a typical psoriasis.

Dr. Weidman suggested that it was psoriasis in a seborrheic subject.

Dr. Arthur Van Harlingen said he considered it a bridge case between psoriasis and eczema, and therefore it did not yield to treatment as readily as psoriasis.

DERMATITIS HERPETIFORMIS. Presented by Dr. Hart-Drant.

A young colored woman, aged 27, had been affected with this disease since 1918. At this time the lesions, vesicular in formation, were confined to groups about the flexor surfaces of the elbows and knees and large bullae affecting the mucous membranes of the mouth and throat. The patient had been blind for several years from the ravages of the disease. Arsenic, particularly in the form of solution of potassium arsenite (Fowler's solution), was the only medication which gave the patient any degree of relief. Diffuse pigmentation and arsenical keratosis of the palms and soles were present due to the prolonged use of arsenic. Dr. Knowles had shown the patient before the Society two years ago.

DISCUSSION

Dr. Knowles said that the keratosis of the palms had not increased during the last two years but that the pigmentation had become more localized.

Dr. Weidman observed that quinin had held an attack in a case he was treating.

Dr. Corson said he was able to control the disease entirely in a patient he had under treatment only with solution of potassium arsenite.

EXTENSIVE FURUNCULOSIS. Presented by Dr. Weidman.

N. F., an Italian youth, aged 18, said that the disease began when he was 5 years of age, following vaccination. There were several hundred scars involving all parts of the body, but particularly the back, thighs and face. Their

margins were slightly hyperpigmented, most were depressed, but some were elevated and soft like the multiple benign tumors of Schweninger and Buzzi. There were numerous furuncles on the neck and face, and a few on the trunk —some of which were surrounded by an infiltrate that suggested a precocious keloidal development, and had a faintly violaceous cast. The patient had been studied in a New York Clinic and said he had had dozens of injections for tuberculosis, and that his blood test was negative. The case was shown to call attention to the similarity of "hypertrophic" scars to the "multiple benign tumors" of Buzzi and Schweninger—to elicit discussion on postvaccination dermatoses and refinements of vaccine therapy. Cultures of a yellow staphylococcus and minute streptococcus were taken from the pustules. No yeasts (or sporotrichums) grew. The Wassermann test was negative in two antigens and positive in cholesterolized antigen. The blood count and differential count were normal. Sections showed a subacute inflammatory process, which ruled out blastomycosis. Gummatous and tuberculous architecture were not exhibited.

DISCUSSION

Dr. Knowles made a diagnosis of acne varioliformis and advised the administration of solution of potassium arsenite (Fowler's solution) internally and ammoniated mercury, externally. He said the large scars were due to the age of the patient at the time of the onset of the condition.

Dr. Dengler asked whether the patient was too young to contract this disease.

Dr. Knowles answered that older people were usually affected, but that there was no reason why a child of 5 years could not develop the condition.

PSORIASIS IN A NEGRO. Presented by Dr. Wright for Dr. Schamberg.

This case was presented because of the rarity of the combination—psoriasis and a colored person; the patient presented patches on the forearms, posterior to the left axilla and in the scalp, which were fairly infiltrated and showed a moderately profuse scaling. Instances of this disease occurring in the colored race are extremely rare. Two such cases were reported by Morrison in the *Journal of Cutaneous Diseases* in 1885; he stated that disappearance of the patches left the skin at their sites depigmented.

DISCUSSION

Dr. Brown said he thought it was a case of psoriasis.

Dr. Knowles said he was rather inclined to the same opinion. He had seen a few cases in the University Hospital, but they usually occurred in the lighter colored negroes.

GRANULOMA PYOGENICUM. Presented by Dr. Markowitz.

Mrs. C. M., aged 22, presented a growth about the size of a hazelnut on the lower lip, of three months' duration. It began as a pin-point lesion, grew rapidly and bled on the slightest irritation or manipulation. Dr. Markowitz asked for suggestions for treatment.

DISCUSSION

Dr. Klauder advised complete destruction by electrodesiccation or two doses of roentgen ray.

DR. KNOWLES suggested the use of the electric needle followed by the application of trichloracetic acid.

ROENTGEN RAY BURNS OF THE RIGHT CHEEK. Presented by DR. MARKOWITZ.

Miss J. T., aged 20, was treated by a physician with the roentgen ray for acne vulgaris. When she presented herself a week before this meeting she had a second degree roentgen-ray burn of the right cheek and lips and a first degree burn of the neck. These lesions had appeared on the third day after her last treatment and were of three weeks' duration.

DISCUSSION

DR. WRIGHT said he saw two patients in his office last week.

DR. KNOWLES said an occasional burn may occur, but that we should be particularly careful in the treatment of the glandular type, that is the young, rather flabby, lightly colored person, or thyroid type.

DR. KLAUDER said that he had not found much difference in the results obtained by the fractional and massive dosage, but there was less risk in the fractional method of treatment.

DR. KNOWLES said that often the untoward results did not appear until some time had elapsed after the treatment and that telangiectasis did not appear until six months after treatment. He thought the Kromayer lamp helped to diminish the disfigurations caused by the presence of telangiectasis.

PARAFFIN TUMORS RESULTING FROM INJECTIONS OF MERCURY.

Presented by DR. WRIGHT for DR. SCHAMBERG.

A woman, aged 38, had received injections of mercury into the deep muscles of each upper arm and each thigh seven years before. She was a nurse and was able to state that the mercury was given in a paraffin base. Nodules had been slowly developing at the sites of the injections. These were purplish, slightly elevated and quite firm. At first sight they had somewhat the appearance of gummatous lesions, but they were more diffuse and boggy. Histologic examination had not been made.

DYSTROPHY OF THE FINGER NAILS. Presented by DR. HART-DRANT.

A white woman, aged 22, presented a dystrophy of the nails of both hands, which began when the patient was 15 years old, about the time of the onset of the menses. Occasionally, tenderness would be felt on pressure about the nails, but usually they showed no signs of inflammation. This case was shown for suggestions as to treatment.

DISCUSSION

DR. KNOWLES suggested that the patient be given Donovan's solution internally and Labarraque's solution—one teaspoonful to a glass of water—to be applied under the nails on a little gauze or with a dropper.

MULTIPLE CHANCRE OF THE FACE. Presented by DR. WEIDMAN.

P. G., a white American man, aged 31, a machinist, showed three frambesiform lesions on the chin and one on the upper lip. Each one was 1 cm. in diameter, fungating and highly vascular and deeply indurated. At that time

the disease was of four week's duration. Regional lymph nodes were the size of English walnuts and fused. The Wassermann test at another hospital had been reported negative. There was no general adenopathy. No fungus was found in epilated hairs, and sections were not distinctive except that they eliminated malignancy; i. e., they showed a nonspecific subacute inflammation. The diagnosis was cleared up only when a second Wassermann test was reported positive and a secondary macular eruption appeared on the chest. The lesions are now regressing under arsphenamin treatment. This was a case which in some points resembled sycosis barbae and blastomycosis, and in which the multiplicity and extreme vascularity of lesions, the negative Wassermann reaction and impracticability of dark-field examination delayed the diagnosis.

Regular Monthly Meeting, Nov. 12, 1923

SIGMUND GREENBAUM, M.D., *Presiding*

RECURRENT HERPES. Presented by DR. HART-DRANT.

A young woman, aged 22, a nurse in training, presented a lesion on the chin which first appeared as a tiny papule, spreading to the size seen. It had entirely cleared up in three or four months, but had recurred two weeks later, following this procedure throughout the year, there being four attacks in all. At times the lesion was dry and about the size of a dime; occasionally there was oozing. Salicylic acid and alcohol had caused the disappearance of the lesion at one time.

DISCUSSION

DR. SCHAMBERG said he did not think it bore the distinct impress of herpes from its present appearance, and that he did not know of any condition which would consist of papules and recur in that way.

DR. STRAUSS said he thought it had the appearance of a factitious eruption.

DR. CORSON was of the same opinion, although nothing in the history bore this out.

DR. SCHAMBERG said he thought it might have been self-induced, and suggested psychic treatment.

A CASE FOR DIAGNOSIS. Presented by DR. LUDY for DR. WALKER.

A white boy, aged 9, presented an eruption of four weeks' duration, which had begun on both cheeks at the same time. He also had patches on the eyelids, the vermilion border of the lips and roof of the mouth besides those on the cheeks and ears. His teeth were good but of a notched type.

DISCUSSION

DR. KNOWLES expressed the opinion that the condition resembled the disseminated variety of lupus erythematosus. It might eventually turn into the disseminated type rather than the discoid.

NEO-ARSPHENAMIN DERMATITIS. Presented by DR. MUNSON.

M. C., aged 35, presented a dermatitis following specific treatment with neo-arsphenamin intravenously. The skin was red, dry and scaly. The patient

was given 6 decigrams of neo-arsphenamin at weekly intervals from June 20, to Aug. 1, 1923. She had vomited and had had headache during this time. On August 25, the Wassermann test was + 4. On August 29, another series of injections of neo-arsphenamin was started, the first three being given at weekly intervals and the fourth one during the second week. On September 29, a severe skin rash appeared which lasted one month. On November 2, one dose of sodium hyposulphite, 5 grains (0.32 gm.), was given; in three days, 10 grains (0.65 gm.), and the next day, 10 grains more. At the time of presentation the Wassermann test was negative. The skin condition had markedly improved following this procedure.

DISCUSSION

DR. SCHAMBERG said he thought it important to record cases of this kind when one can come to a definite conclusion. The treatment was first suggested by Rabeaux of Paris. Laboratory investigations carried out since suggested the value of certain sulphur preparations.

A CASE FOR DIAGNOSIS. Presented by DR. KNOWLES.

A young Hebrew, aged 21, gave an indefinite history concerning a growth on the instep of his right foot. It was of about twelve years' duration. The diagnosis could not be made positively as there had been no biopsy. This had been neglected because it was felt that the entire lesion should be excised rather than a small piece. Three diagnoses were to be thought of: (1) granuloma pyogenicum, were the lesion not quite so large; (2) a vascular nevus which had undergone certain malignant changes, (3) sarcoma.

DISCUSSION

DR. SCHAMBERG said he thought the patient had an ulcerating neoplasm which he believed, as did Dr. Knowles, was undergoing malignant change. It might be carcinoma or possibly sarcoma. If the history was accurate, evidently it had not been sarcoma primarily. It might have been a nevus, but it hardly looked sufficiently vascular and had a great deal of pigment. The growth was a distinct menace to the patient's life and should be radically excised and followed by strong radiation. Often insignificant looking growths, less formidable in appearance than this, developed into malignant growths. He had seen on the day of the meeting necropsy material from a patient who had developed an enlargement of the supraclavicular glands on the left side which proved to be sarcoma. The primary lesion had been a small mass in one testicle.

DR. GREENBAUM said the French recommended the use of electrocautery, but not direct cutting, in making a biopsy in such a case.

PSORIASIS. Presented by DR. CORSON.

A. H., a child, aged 4, colored, presented an eruption which had been present for about five weeks. It was a maculosquamous type of outbreak, particularly favoring the scalp and extensor surfaces. Psoriasis was spoken of as being somewhat of a rarity in the colored race, but although this child was obviously of mixed blood, it seemed worth while showing. She had had an abscess on the neck last spring. The Wassermann test had not been taken.

DISCUSSION

DR. KNOWLES spoke of the rarity of psoriasis in the negro, but said it was not so unusual to find it in the lighter colored type. It was practically unknown in the darker of the race.

DR. HIRSCHLER said he thought it was rather unusual to have as many lesions with so scant an amount of scales, which indeed appeared more as crusts than scales, rather pointing against psoriasis.

DR. KLAUDER suggested pityriasis rosea, as many lesions had a linear formation on the sides of the chest. There were many cases of generalized involvement, more often than one is led to believe from textbooks. He was inclined to make a diagnosis of pityriasis rather than psoriasis.

DR. SCHAMBERG spoke of a case in a colored woman, presented as psoriasis last month, with an eruption over the arm and in the scalp, as being seen on the day of this meeting, which looked less like psoriasis than the condition in this case. The eruption on this child might be diagnosed as psoriasis, but if the child was watched for a month, the opinion might be changed.

DR. CORSON said that Hazen said that among 2,000 cases of skin eruptions in negroes he had seen, eight were psoriasis. Dr. Chalmers also saw a number of undoubted cases in Africa.

DR. KLAUDER said he did not think this disease occurred in the very dark skinned races.

DR. KNOWLES said he thought that in most circumstances where there was plenty of sunlight psoriasis did not occur. This condition usually obtained in restive races.

DR. GREENBAUM said he thought a biopsy would be of value in a case of this kind.

DR. CORSON said he would report at the next meeting.

A CASE FOR DIAGNOSIS. Presented by DR. WRIGHT for DR. SCHAMBERG.

The colored woman shown at the last meeting presented a lesion on the right cheek just under the eye, which was more suggestive of lupus erythematosus. There was also on the scalp a patch which looked somewhat like psoriasis. The patch on the arm looked, as before, like psoriasis. A change in the diagnosis would be based on the appearance of the lesion on the cheek.

DISCUSSION

DR. SCHAMBERG remarked about the condition on the lower part of the arm as being not as characteristic of psoriasis today as it was a month ago. The patient was using some ointment on it, and part of the eruption was free from scales. It did not show the characteristic scaling of psoriasis. In the negro we may not get the exact picture of psoriasis as we see it in the white race as there may be some difference in the conversion of epithelial cells into keratinized cells. One had not seen a sufficient number of cases in the negro to say whether the manifestations are unlike those in the white race. The picture was suggestive of psoriasis but still required reservation in diagnosis and a further study of the case.

DR. WRIGHT spoke of looking through an old number of the *Journal of Cutaneous Diseases*—1885—in which cases were reported by Morrison, in two of which when the patches disappeared pigmentation remained.

A CASE FOR DIAGNOSIS. Presented by Dr. Greenbaum.

J. L., a young white man, in 1919 noticed a swelling in the left submaxillary region which was dignosed as tuberculosis and at an operation in January, 1920, a gland was removed and a diagnosis of Hodgkin's disease was made. The glands at both sides of the neck had enlarged by this time but no other glands were involved. In February, 1920, the glands on the right side were removed, two weeks after which erysipelas in the face developed and a soft lump appeared at the nape of the neck. This was opened and diagnosed as tuberculous. In July, 1920, another small gland was taken out and then roentgen-ray treatment was given over the gland area. In October, 1920, a small area of redness appeared below the left eye, gradually enlarging. Tuberculin or partial antigen treatment was given, but the area continued to spread. In January, 1922, the Alpine lamp was used without result. Radium was then used which almost healed it.

The case showed (1) lupus erythematosus associated with tuberculous glands, (2) effects of radium.

DISCUSSION

Dr. Schamberg said the result of treatment in this case appears to have been satisfactory, but he should hesitate very much about applying roentgen ray in lupus erythematosus. He had seen unfortunate results in cases treated by others and doubted the cure of active lupus erythematosus, as it was an attempt to cure by local means a condition which was of systemic origin. Treatment produced structural changes in the patches, which made it impossible to use active medication thereafter. He believed lupus erythematosus was etiologically related to tuberculosis.

Dr. Knowles said that Dr. Guiterman had reported several cases in the past with focal infections. The removal of infected teeth, which hardly had any relation to tuberculosis, had cleared up the condition entirely without local treatment. The cases should be separated in other classes. The discrete type was questionable, but the disseminated type should be put down as tuberculous. The cases seemed so diverse that they should be put under different headings.

Dr. Ludy agreed with Dr. Knowles, and spoke of a patient with a sinus case treated successfully and of one case treated by several men which was cleared up by the removal of bad teeth. These cases were of the discrete type.

Dr. Klauder suggested the Alpine lamp in the treatment of lupus and also the beta rays of radium.

Dr. Knowles was of the opinion that carbon dioxide snow was useful in the local treatment, given in twenty, thirty or forty second doses. There were several methods. Brocq used only ten seconds and without pressure. The type of the case, the depth of the lesion and the color should be noted and then the proper measure selected.

Dr. Greenbaum said he thought it sometimes disappeared spontaneously, so that removal of teeth, etc., could not count a great deal.

XANTHOMA TUBEROSUM. Presented by Dr. Klauder.

The tumor had been destroyed by electrodesiccation. The right elbow and left knee had been involved.

DISCUSSION

Dr. Knowles said he did not think this form of treatment always had the best cosmetic effect. Here there was more scarring than if the growths had been excised.

Dr. Klauder said he was convinced that electrodesiccation as used in the removal of warts, moles, etc., was the superior method and left less scarring than other agencies.

ATROPHIC SCARRING AFTER SECONDARY SYPHILIS. Presented by Dr. Decker.

Two years ago this patient was infected. There was a severe secondary eruption over the back with other manifestations of secondary syphilis. The patient came into the Pennsylvania Hospital about a month before for treatment. Numerous depressed scars were now visible in the region previously occupied by the syphilitic eruption.

PARAPSORIASIS. Presented by Dr. Klauder.

A colored woman, about 35 years of age, presented a generalized, scaly eruption, on the arms, chest and back. There were no subjective symptoms present. The patient had been seen by Dr. Gilchrist in Baltimore.

DISCUSSION

Dr. Schamberg said this case presented features that would point against the diagnosis of parapsoriasis, that is, scaling, erythroderma and the long duration. If it were not for the inflammation present in the skin, one might think of ichthyosis. The microscopic picture was not in accord with parapsoriasis, and he considered it a scaling erythroderma in an ichthyotic subject.

Dr. Knowles agreed with Dr. Schamberg in this diagnosis, particularly as the history went back to childhood. Dry scaly skins were apt to develop inflammatory conditions. Some inflammation had developed on an extremely dry skin giving rise to the present outbreak. Dr. Knowles expressed the opinion that the term "parapsoriasis" meant nothing. Originally, "eczema" was the one word used as the dumping ground for various conditions of the skin, now parapsoriasis was used.

Patricia Hart-Drant, Secretary.

ST. LOUIS DERMATOLOGICAL SOCIETY

Regular Meeting, Oct. 10, 1923

Joseph Grindon, M.D., *Presiding*

A CASE FOR DIAGNOSIS. Presented by Dr. Richard Kring.

A white man, aged 53, single, a druggist, gave a family history which was negative for carcinoma. There was no history of syphilis. In 1903, an attack of gonorrheal rheumatism necessitated an operation upon the knee. In July, 1923, lesions appeared on both sides of the frenum of the tongue, light red with darker red pin points scattered over the surface. The border was some-

what irregular. To the exploring finger, the lesions felt like a layer embedded in the surface. It had existed for twelve months and had been treated with caustics. There was definite enlargement of the cervical lymphatics, but the diagnosis of the original lesion was impossible on account of the severe reaction from the caustics. When Dr. Grindon first saw the case with Dr. Kring, he advised abstaining from all irritating applications, and the use of a weak antiseptic wash. There was little appreciable infiltration at the floor of the mouth, but palpation of the tongue showed a hard mass about the size of a filbert, slightly to the left side, well toward the rear, and a little below the superior surface. The Wassermann test was negative. Mixed treatment was instituted for several weeks, but caused no improvement. The patient was then placed on potassium iodid, 3 grains (0.19 gm.), three times a day gradually increased, together with a small dose of strychnia as a tonic.

DISCUSSION

Dr. Mook said he thought the small lesions near the border of the tongue looked like an inflamed verruca. The lesion at the base of the tongue and floor of the mouth looked more like an infection that had healed, leaving a small, smooth, red spot. The tumor growth deep in the depression of the tongue he thought very suggestive of carcinoma, especially in view of the enlarged glands on that side, which were not inflamed, but rather suggestive of tissue growth or metastasis.

Dr. Kimbrough said he did not believe the lesion under the tongue was a primary lesion.

Dr. Mook said he believed also that it had nothing to do with the tumor, nor with the lesion on the right side.

Dr. Toomey agreed with Dr. Mook's diagnosis of the tongue lesion as an inflamed verruca; but, in regard to the deep tumor mass, he did not feel sure that it was carcinomatous. The latter lesion seemed to be a gumma of the tongue. The fact that the enlarged cervical glands were known to have undergone no appreciable change for more than a year suggested a syphilitic adenitis rather than carcinomatous metastases.

Dr. Grindon said that the suspected carcinomatous lesion seemed to him a little smaller and softer than when he first observed it, and that several of the lymphatics were less pronounced than they appeared to be last July. He said that carcinoma in that situation, deep-seated within the tongue, would be most unusual; and that primary sarcoma of the tongue practically did not exist; that he had never heard of a case of that kind on record. In his opinion, the diagnosis lay between a gumma and a fibrous nodule possibly due to gonorrheal rheumatism.

Dr. Kring said he believed the lesion under the tongue seemed to be diminishing, and he asked for a diagnosis.

Dr. Grindon asked what treatment had been used.

Dr. Kring said that the nodule in the tongue looked like a gumma due probably to an old syphilis. Gummas were at times very slow, undergoing resolution, lying dormant for a long time. He thought he had noticed a slight change in the lesion when the patient was given antisyphilitic treatment, being smaller, at first rounder, later on becoming less hard and elongated. Dr. Kring said he would like to give the therapeutic test more time.

DR. TOOMEY remarked in reference to sarcoma of the tongue that Dr. William Coughlin had written a paper on the subject of primary sarcoma of the tongue which appeared in the *Annals of Surgery* about eight years ago.

A CASE FOR DIAGNOSIS. (ACUTE INFLAMMATION OF THE PALMS.) Presented by DR. JOSEPH GRINDON.

A white woman, aged 27, a stenographer, had been exposed to no known infection. About September 25, several purplish spots appeared at the ball of the right thumb, and a few days later, at the palmar surface of the first phalanx of each finger of the right hand. These extended into a continuous sheet of erythema with edema, local heat, pain and tenderness, making the lightest contact unbearable. A few vesicles developed over the thenar eminence. On October 2, spots appeared at the center of the left palm and at the second, third and fourth interdigital spaces. These were not painful. On October 3, the pulse was 80; temperature, 99 F. Serum from the unbroken vesicles was planted on glucose agar, blood agar and Loeffler's medium. These remained sterile in the incubator on the third day. The patient had been using "germicidal soap" for mosquito bites. The right hand was put into a hot pack. On October 4, the right hand was much better, but the left hand was worse, the lesion spreading with some vesiculation. A red streak of lymphangitis extended a short distance up the forearm. The hot packs were continued and both palms improved. At presentation they were only slightly tender and the inflammation was fast subsiding. The interesting feature was the appearance of the dermatitis simultaneously at a number of separate points.

DISCUSSION

DR. MOOK said that the case in its clinical appearance impressed him as being similar to an erysipeloid, although the multiple lesions existing in both palms would indicate otherwise. He believed it to be some kind of an infection of a low grade, perhaps streptococcic, the second palm becoming infected from the first, in view of the fact that the new lesions appeared one week later.

DR. GRINDON called attention to the fact that the glucose agar, blood agar and Loeffler's medium were sterile at the end of the third day.

DR. MOOK repeated that he thought the lesions were streptococcic. He recalled many cases of infection that Dr. Sabouraud had treated during the World War in which the cultures were sterile, but which when put into sealed tubes under anaerobic conditions were found to contain streptococci. He said he had seen quite a number of secondary wound infections following a compound fracture, for instance, with the cultures sterile unless carried out under anaerobic conditions; also a low grade inflammatory condition at the corner of the mouth, such as perlèche, in which streptococci were also found, these lesions becoming well under silver nitrate treatment and the usual applications for streptococcic infections.

DR. ENGMAN said that when he observed the lesion for the first time, it looked like some systemic condition, toxic, for instance, on account of its being symmetrical, deep-seated and containing multiple lesions.

DR. CONRAD asked what the diagnosis of the lesion was.

DR. GRINDON replied that he had reached negative conclusions only. He did not believe it an erysipeloid, because the temperature and pulse were normal, because of its beginning at different points, and because it did not follow the

ordinary course of an erysipeloid. There were five original points on one hand and six on the other, which later coalesced.

DR. KIMBROUGH inquired whether such a condition could be caused by chemical irritation followed by infection.

DR. GRINDON replied that the condition had been treated solely by wet dressings of plain gauze. This girl had come to the United States recently from Canada, had suffered much from heat and insect bites, and had used "germicidal soap" on her hands for the bites. He believed there might be an explanation along these lines.

DR. MOOK remarked that he believed germicidal soap would affect only very tender skin whereas the skin on the palms was more resistant.

A CASE OF PAGET'S DISEASE. Presented by DR. RICHARD KRING from St. John's Hospital Dispensary.

Mrs. D., a widow, aged 48, gave a negative family history. The present lesion began three or four years ago as a "small blister" which was slightly itchy. The patient was first seen on August 23, at which time she presented an irregularly shaped but sharply outlined patch surrounding the nipple, about 2½ inches (6.3 cm.) in its longest diameter and covered with light yellowish scales and crusts. These, when removed, exposed a raw, red, granulating surface, exuding a viscid secretion. The nipple was obliterated to such an extent that its former site could scarcely be determined. A hard mass could be felt ascending along the lactiferous ducts. The axillary glands were not palpable. Amputation of the breast was advised, but the patient refused her consent, and roentgen-ray therapy was then inaugurated (August 19) with 1½ skin units, twice repeated since that time at intervals of three weeks.

DISCUSSION

DR. GRINDON said that the most interesting point in this case was that of therapeusis. Dr. Kring had urged on the patient the necessity of a surgical operation. She had refused to have an operation. He then employed roentgen-ray therapy. Dr. Grindon said in his opinion it was doubtful whether the roentgen rays should have been used. He felt that Dr. Kring should have dismissed the patient rather than to assume the responsibility, for while roentgen rays as used might clear up the superficial lesion, they would not cure the deep condition.

DR. MOOK concurred in this opinion, observing that a patient with a similar case whom he had seen two years ago had been treated with radium. However, a tumor developed later, necessitating a breast amputation. He believed such conditions should be operated on at once in order to prevent the usual more serious developments.

DR. KRING added that he had looked up the literature regarding the results of roentgen-ray treatment in such cases, and in many instances the results were excellent. He, therefore, had decided to give the roentgen rays a longer trial in this case.

DR. GRINDON remarked that excellent results had been reported in such cases, but that the value of such reports would depend on the length of time the patient remained under observation.

DR. KIMBROUGH said that he did not advise the use of radium in such cases for the same reason; that is, that although radium might clear up the superficial lesion, a tumor might develop later.

A CASE OF KERATOSIS PILARIS. Presented by Dr. W. D. Davis.

A schoolboy, aged 12, gave a negative family history. The present condition started about one year before, lesions appearing on the right knee and elbow and on the outer border and dorsum of the left hand. The patch on the knee was one-half the size of a man's hand; that on the elbow, about the size of a silver half-dollar. The lesions were rough, resembling a nutmeg grater, distinctly follicular, with a horny plug at the apex of each follicle involved. They were noninflammatory, and the plugs could be flaked out. The condition improved under treatment.

DISCUSSION

Dr. Brockelmann said he believed it was a case of lichen pilaris.

Dr. Mook said the patches were a form of chronic dermatitis due to staphylococcic infection from scratching. These were seen so infrequently on the elbows, likewise the patches of chronc lichenification on the wrist, that it is difficult to differentiate them from psoriasis. Staphylococcic infection in the skin, essentially in psoriatic infections, would yield very easily to roentgen-ray treatment. A number of them yield readily to tar and white precipitate or some similar antiseptic.

Dr. Toomey said that, anatomically considered, he believed the lesions were undoubtedly lichen spinulosus, but the patient's statement to the effect that patches on the abdomen had disappeared in two or three days under the use of a salve would lead him to question whether the latter lesion was similar to the lesion diagnosed. In some places the lesions were scattered and looked more like comedones than typical lesions of lichen spinulosus; they were soft rather than hard and flatter than the latter lesions. The area on the back of the wrist looked very much like the condition to which Crocker gave the name of "grouped comedones."

Dr. Greiner said that he thought the lesion was lichen spinulosus.

Dr. Kring said he thought that Dr. Mook's explanation had covered the case. He thought it difficult to classify these lesions, three or four conditions usually bringing them about.

Dr. Grindon said he would be inclined to call the condition "lichen spinulosus" rather than to say that it was due to a staphylococcic infection, the situation not being an unusual one for lichen spinulosus. He had observed a supposed lichen spinulosus which later developed into a typical lichen planus.

A CASE FOR DIAGNOSIS. Presented by Dr. W. Porter Brown from the Barnard Free Skin and Cancer Hospital.

A white girl, aged 13, gave a negative family history. The present trouble began three years before consisting of lesions about the size of a silver dollar just below the right knee, covered with asbestos-like scales. There were also a few dry, erythematous, slightly scaly plaques on the forearms and face which had been present for one month. She had had similar lesions on the forearms and face, with intervals of complete remission. There had been no local treatment.

DISCUSSION

Dr. Kring said he thought the patch on the knee was a plain case of psoriasis. As to the condition on the arms, he did not feel quite certain as to

the diagnosis, but he thought it was probably due to some drug previously administered.

DR. GREINER said he thought it an ordinary case of psoriasis.

DR. TOOMEY said he did not believe the condition was psoriasis. The lesions on the arms were definitely not psoriatic, bearing more resemblance to the eczematoid condition seen in a type of acquired hypothyroidism. As to the lesion in the skin over the upper part of the tibia, it suggested a patch of chronic trichophytosis. He thought it rather difficult to come to any definite conclusion in this case.

DR. MOOK was of the opinion that the patch on the knee was psoriasis, but the branny, scaly dermatitis on the arms and face he thought was a pityriasic condition, such as is found in the dry, delicate skin of children during the winter months.

DR. ENGMAN pronounced the condition psoriasis.

DR. CONRAD called attention to the number of skin conditions that resemble psoriasis. The lesion on the arm looked to him like dermatitis due to some external cause.

DR. BROCKELMANN said he believed the dry and scaly condition of the skin on the forearms and face was a dermatitis seborrheica, while the lesion on the knee looked like psoriasis to him.

DR. GRINDON said he thought the condition was seborrheic dermatitis.

A CASE FOR DIAGNOSIS. (ERYTHEMA MULTIFORME? PITYRIASIS ROSEA?). Presented by DR. RICHARD S. WEISS from Dr. Engman's Clinic at Washington University Dispensary.

A white man, aged 24, an Italian, a presser, presented a generalized eruption of about one month's duration which was thickest around the joints and flexures. There were a few lesions on the fingers and palms. The isolated lesions were pale red, circular and oval, some slightly scaly, and they appeared to follow the cleavage lines of the skin. Many of the lesions were scaly plaques; others were circinate, clear in the center, with an urticarial character to the rings. Some had a narrow surrounding zone of erythema. There was in addition an acute dermatitis of the neck, arms and flexures, due to irritating applications.

DISCUSSION

DR. GREINER said that in his opinion this was a case of erythema multiforme, judging from the character of the lesions in the palms and some of the types of lesions on the back. These, he thought, in no way suggested pityriasis rosea.

DR. TOOMEY said he had not seen a case of pityriasis rosea in which there were lesions on the palm, and that the lesions on the back looked more like erythema multiforme than pityriasis rosea. He would be inclined to minimize the diagnostic value of the statement that no bone or joint aches or other evidence of systemic intoxication had been noticed, as often they are so slight and vague as to escape the notice or proper interpretation by some patients.

DR. MOOK inquired whether there was any history of a primary lesion which looked like ringworm, for instance. He mentioned the frequency of patients with primary ringworm-like lesions treated with tincture of iodin, which became much larger and were followed by a generalized eruption of oval and circinate lesions all over the body. There were furfuraceous patches characteristic of

pityriasis rosea which had been complicated by a specific dermatitis, the lesions being changed by a medicinal dermatitis. In the present case, the duration of one month is against the diagnosis of erythema multiforme.

Dr. Conrad said that when he first saw the case it looked like erythema multiforme. Later when he saw the lesions on the back and body, he thought they were the beginning of pityriasis rosea, but his final conclusion was that they were lesions of erythema multiforme which in a few days changed to those of pityriasis rosea.

Dr. Engman said it might be laid down as a general rule that there is no reasons why erythema multiforme might not have been preceded by pityriasis rosea.

Dr. Grindon did not agree with the diagnosis of erythema multiforme, but remarked that a French author, Pater, had reported erythema multiforme as an adventitious rash in typhoid fever.

Dr. Engman added that he had treated two patients with typical lichen planus which had been preceded by erythema multiforme.

Dr. Brockelmann remarked that when he saw the patient two days previously, the condition looked different; it had a definite appearance of pityriasis rosea. He thought the lesions on the neck and arms were dermatitis venenata.

Dr. Grindon said that he felt that the physicians at the Bernard Hospital were rather inclined to extend the definition of "pityriasis rosea."

Dr. Engman replied that all the lesions in the case shown were typical pityriasis rosea vesicles, and that the case ran a typical course of that condition.

A CASE FOR DIAGNOSIS. Presented by Dr. Norman Tobias from Dr. Engman's Clinic at Washington University Dispensary.

J. W., aged 8, a schoolgirl, entered the clinic, complaining of a loss of the nails of the fingers and toes. The process began in January, 1922, with a thickening and warping of the finger nails, followed two or three weeks later by involvement of the toe nails. In about a month there was a complete shedding of all the nails. This was painless and not associated with any general disturbance. The patient was given solution of potassium arsenite (Fowler's solution) in August, 1922, and by October there were signs of a regrowth of the nails, the toe nails growing in first. At the present time, all the nails have reappeared except that of the left thumb. The nails are of normal color and size, but show evidence of slow growth. Longitudinal fissures and furrows are present, and lunulae are lacking. In some of the nails there are lateral depressions. The etiology in this case was obscure, as there was no history of predisposing disease or a congenital or hereditary history. The Wassermann test was negative, as were cultures from the nail scrapings. Cultures from the new nails and examination of the teeth and hair were negative.

DISCUSSION

Dr. Engman said he believed this lesion probably belonged to the type that is sometimes seen after infectious diseases in children, particularly after severe attacks of grip, followed by dystrophic conditions of the nails of the fingers and toes.

Dr. Kring remarked that the patient looked pale and anemic, and that probably some constitutional condition had caused the dystrophic changes in

the nails. He suggested prescribing iron for a month or so in order to aid nutrition.

DR. ENGMAN observed that the nails had improved noticeably.

DR. KRING agreed that they were better, but he said that there was still a little dwarfing present.

ACTIVE SYPHILITIC SKIN LESIONS IN A CASE OF ATAXIA. Presented by DR. A. H. CONRAD from the service of Drs. Engman and Mook, Washington University Dispensary.

A white man, aged 45, married, was referred from the Department of Neurology with a diagnosis of locomotor ataxia. At that time there had been a general staphylococcic folliculitis of the trunk and arms, with a patch of acute dermatitis on the back. This was treated, and disappeared after several days. At presentation there was a patch of lichenified papules on the upper right arm, midway between the elbow and shoulder, about 2 by 3½ inches (5.08 cm. by 8.8 cm.) in size. These were firm to the touch, light red, with the tops rather flattened (lichen chronicus), with some excoriations due to scratching. These lesions had been present at intervals for the past twelve years, having begun just above the elbow. On the outer side of the right hand, just below the wrist, was a thickened serpiginous lesion about 2 inches long, infiltrated, part of it being covered with some loose scales. This was dark red, with a duration of five or six months. On the right forearm, midway between the wrist and the elbow, was a similar lesion which was not as pronounced as the one below the wrist, and was not as deeply infiltrated, with a duration of two weeks. The Wassermann reaction was one plus. In passing, it might be mentioned that the patient gave no history of infection, but that the father had had syphilis.

DISCUSSION

DR. ENGMAN said that in his opinion the lesions with scales on the posterior aspect of the forearm and the hand were syphilitic in character, rarely seen in tabetic patients. The lesions on the anterior part of the upper arm were a lichenification.

DR. KRING agreed with this opinion.

DR. BROCKELMANN said he thought the lesions on the upper arm were a lichen circumscriptus chronicus (Vidal's type); those on the forearms, late syphilis.

DR. GRINDON remarked that cutaneous lesions were rarely seen in a neurosyphilitic patient.

DR. CONRAD said that this peculiarity was his reason for presenting this case.

A CASE OF GRANULOMA INGUINALE. Presented by DR. NORMAN TOBIAS from Dr. Engman's Clinic at Washington University Dispensary.

C. N., a colored man, aged 24, single, had been admitted to the clinic with an ulceration of the posterior surface of the penis and a portion of the raphe of the scrotum, of seven months' duration. He had admitted having chancres and a bubo in January, 1923. At presentation there was an irregular area of ulceration 2 by 2.5 cm., involving the posterior surface of the shaft of the penis and the lower fourth of the scrotal raphé. The ulcer had a punched-out appearance, with rolled borders and a red, moist, granulating floor. Follow-

ing the injection of tartar emetic intravenously, healing commenced, with the formation of a bridge of scar tissue across the lower third of the ulceration. The Wassermann reaction was one plus. The scars of the previous chancres were present on the frenum.

DISCUSSION

DR. GRINDON said it might be a granuloma tropicum, this supposition being strenghtened by the fact of improvement after four injections of antimonium and potassium tartrate. The clinical appearance, however, was different from that of those cases of tropical granuloma which he had had the opportunity of studying. He felt inclined to think it was an ulcerating, nodular or gummatous lesion.

DR. TOOMEY said he had never seen ulcerating granuloma of the pudenda (or granuloma inguinale) while the patient was undergoing treatment with antimonium and potassium tartrate, so he was in no position to dispute the diagnosis; but the history that there had been an initial rapid sloughing out of a considerable mass of tissue and a subsequent evolution into a smaller ulcer with a fairly clean glistening surface and sharp indurated borders, would incline him away from the diagnosis of granuloma inguinale. Such cases were really deserving of exhaustive bacteriologic and histopathologic study, as it is important to learn as soon as possible how much of what we in temperate regions have been calling chancroid due to the Ducrey's bacillus is in reality granuloma of the tropical type.

A CASE OF POSTVACCINAL PEMPHIGUS. Presented by DR. ROBERT H. DAVIS from the Barnard Free Skin and Cancer Hospital.

F. A., a white girl, aged 6, gave a negative family history. She had had mumps at the age of 2 years. The present illness covered a period of twenty-one months, following vaccination in February, 1922. Before the scar of the vaccination had healed, the eruption had appeared. It was bullous in character, the bullae arising on apparently normal skin, being most marked on the extremities and genitocrural regions. They soon became purulent, with an erythematous areola and an infiltrated base. Crusting followed, then there was a gradual disappearance of the lesions, leaving pigmented areas. There was no definite scarring. There was slight pruritus, but no marked constitutional symptoms.

DISCUSSION

DRS. MOOK and CONRAD concurred in the opinion that the most interesting feature of this case and others with like symptoms was the period of incubation following vaccination, varying from ten days to three months, with an average of three or four weeks.

A CASE OF DIABETIC DERMATITIS. Presented by DR. W. D. DAVIS from the Barnard Free Skin and Cancer Hospital.

Mrs. F., a white woman, aged 89, a widow, gave a negative family history. The present illness had started eight months before with symptoms of increasing thirst, gradual loss of weight attended by polyuria and a marked pruritus of the vulva, and an eruption which gradually increased to its present dimensions. At presentation there was a markedly inflamed, excoriated and weeping eruption of the entire vulva, the inner surfaces of both thighs, both inguinal

regions and the mons pubis, extending onto the lower part of the abdomen. The eruption was in the main a solid patch of dermatitis, around the borders of which were a few maculopapules. Examination of the urine showed: specific gravity, 1.029, cloudy, acid, sugar positive, four drops reducing 3 c.c. of Benedict's solution; albumin, negative, epithelial cells; amorphous urates; no acetone. The case was presented merely to demonstrate a parallel case which had been treated by insulin.

DISCUSSION

DR. MOOK said that this case would be presented later after treatment with insulin alone to note the results in clearing up the dermatitis.

Correspondence

"A HITHERTO UNDESCRIBED CONDITION OF THE TONGUE"

To the Editor:—In the December number of the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY an article by Dr. Cannon and myself was published under the title of "A Hitherto Undescribed Condition of the Tongue."

Credit for the original description of this condition should be given to Dr. L. Brocq and Dr. L. M. Pautrier, who published in the *Annales de Dermatologie et de Syphiligraphie,* volume 5, page 1, 1914 to 1915, an article entitled "Glossite Losangique Mediane de la Face Dorsale de la Langue" in which the authors describe both clinically and histologically the same type of lesion. In the same volume, on page 615, Dr. W. Dubreuilh has reported two analogous cases.

We are very glad to give these authors credit for their original observations and regret that their work was overlooked.

J. A. FORDYCE, M.D., New York.

Book Review

LABORATORY DIAGNOSIS OF SYPHILIS. A MANUAL FOR STUDENTS AND PHYSICIANS. By HIDEYO NOGUCHI, M.D., M.S., PH.D., D.Sc., Member of the Rockefeller Institute for Medical Research, New York. Fifty illustrations, of which thirteen are in color. Price, $7.50. New York: Paul B. Hoeber, Inc., 1923.

The laboratory tests for syphilis are divided into those which detect *Spirochaeta pallida* and those which demonstrate changes in the body consequent to infection. Taking up first the complement-fixation reaction as the most important of the latter class, the first five chapters contain an excellent discussion of the phenomena on which the serum test is based. Then follow a description of the many modifications of the original Wassermann test, a chapter on the effect of inactivation of human serum and a full description of the technic of the author's modification of the test. The modifications using human complement are discussed and a preferred technic given. This is followed by a brief description of the Wassermann system and its modifications.

The author presents well and briefly the diagnostic value of the complement-fixation test. The next chapter on the effect of antisyphilitic treatment on the serum test is evidently based on work done in the early days of arsphenamin therapy and is a serious defect in a modern exposition of the subject. A more serious mistake is the quotation from Vernes of the opinion that a patient who remains clinically and serologically free from symptoms for eight months after cessation of antisyphilitic treatment is permanently cured. This is dangerous teaching. This chapter is a good illustration of the impropriety of a laboratory worker's excursion into clinical medicine in which he is not an expert.

Interesting, though of no practical value, is the chapter on specific complement fixation with an emulsion of culture of *Spirochaeta pallida* as antigen. Another chapter is devoted to the luetin test; then follows a practical and thorough description of the various tests of the spinal fluid, including a new precipitation test originated by the author and Miss Tilden. The remainder of the book is the best part of it—an excellent description of the dark-field condensor and explanation of its use, with a careful differential description of the morphology of the several forms of spirochetes likely to be found in looking for the pallida. Staining methods, including the latest, are also given. This is highly commendable and worthy of the distinguished author. A good bibliography and glossary of technical terms complete the work.

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